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The Recent Check to the Increase of London.

THE subject of the growth and extension of the metropolis is one that cannot fail to pre-occupy the architect, no less than the sanitary reformer. It is one that has repeatedly been discussed in our pages. From time to time we have taken occasion to mark the rapidity with which the great city is extending its streets and squares; to calculate what length of street, if reduced to a single line, is built per year or per week: and to indicate, on the map of Middlesex, where the outskirts of London may be expected to lie in ten, in twenty, or in thirty years. In most of the calculations which either we ourselves or other writers on the subject have recently made, the rate of increase of population, and thus of accommodation, has been taken at the allowance of a duplication of the population in the period of forty years. Indeed, a disposition was shown, on the face of the statistical returns on the last occasion that we took to investigate them with reference to this subject, rather to an increase than to a reduction in that portentous rate of growth.

We are now in possession of information which shows that a sensible check has been interposed on this rate of increase. It may not be the case that the extreme point has been touched. It may, or may not, be the case that the check is anything more than temporary. But the subject is so important to all concerned in building, that it will well repay the trouble of analysis.

The highest rate of activity attained by the builder in London was about the years 1862 to 1864. In two years, then, according to the report of the Commissioner of Police for the Metropolis, no fewer than 35,163 new houses were built, being at the rate of 17,581 per annum. These houses formed 825 new streets, and ten new squares, giving a total length of 164 miles of streets and squares,—or eighty-two miles per annum. We regret that the numbers that we have before us are not given for each year. Two or three years are lumped together, so that it is not possible to detect which year was actually the most busy. From 1864 to 1867 the number of houses built was 48,565. This gives an average of 16,155 per annum. The year 1867-1868 is given alone. The number for this year was 15,963. It is thus evident that the extreme point of activity was attained between 1862 and 1867, although we cannot as yet put the finger on the exact year. But when we remember the mirk May of the year 1866, and the terrible financial earthquake that shook city and country with the fate of the house of Overend, Gurney, & Co., we think some light is thrown on the reason of the movement which becomes apparent from an analysis of the figures tabulated by the Commissioner of Police. Up to 1865, so far as the figures before us go, the increase of the metropolis was not only steady, but, on the whole, was slightly increasing from year to year. The advance, as measured by house-building, from 1849 to 1866 was enormous. The annual increase may be said to have doubled. From 1849 to 1854, a period of five years, 40,743 new houses were built in London. This gives an annual rate of 8,148 houses. From 1854 to 1862 there was a decline in activity. The annual rate sank to 6,618,—the total number for the six years in question being 52,949. We have seen how large was the increase in the three following years. Thus, while, as before remarked, we are not able to detect the exact *maxima* and *minima*, we cannot doubt that the extreme activity of the builder, as compared with his greatest slackness, has been as three to one within a period of ten years. And we may fairly consider that at least 18,000 houses have been added to London in a single year of great commercial activity.

Since February, 1870, at which time a difference appears to have been made in the manner of keeping the accounts, there has been a steady decrease in the number of houses annually added to the metropolis. The number for 1867-8 was 15,963. That for the next two years is perplexed by the change of month above mentioned. In 1871 8,693 houses were built. Greater activity was evinced in 1872, possibly in anticipation of some stringent measures for protecting the public health as likely to be passed in that year's session. In this exceptional year 11,179 houses were built. In 1873 the number was 7,687, and in 1874 it was 7,764. The number of 3,542 houses are tabulated as "now being built"; but as the month during which the enumeration was made is not stated, we do not gain so much light from these figures as might otherwise be the case. The total number of houses built from 1849 to 1874,—that is to say in a quarter of a century,—is 270,327, giving an average of 10,813 per annum. In 1869 the number of houses in London is returned by the Registrar-General at 400,778, the density of population being then 7·8 persons per house. Unless an enumeration of the empty houses be added to that of the total number of houses, we fail to obtain that exactitude of statistics which is desirable. The last return of the total number of houses for 1875 was 518,558, which, compared with the estimated population in the middle of 1875, amounting to 3,445,160, gives a density of 6·6 souls per house. A question, however, is always likely to arise as to the different purposes for which estimates are made, as the returns may possibly be affected from that cause. Thus the numbers of houses returned by the Registrar-General in this instance are those which are supplied with water by the water companies. It does not follow that this represents the actual house accommodation of the metropolis. Nor is it altogether likely that between 1869 and 1875 there should have been such a change in the habits and condition of the Londoners as to reduce a density of 7·8 to a density of 6·6 persons per house. We can only deal, however, with the figures before us. They show that while, during the past twenty-five years, an average annual number of 10,800 houses have been added to London, a rate that at one time was raised to 18,000, and at another fell to 6,000, the annual addition at the present time, gradually diminishing since 1869, is about 7·750.

Another comparison may be made, which, if not absolutely conclusive, yet is of some value as bearing on the subject of the permanent rate of increase. The addition to the number of houses in London for the last year, reported by the Commissioners of Police is, as before mentioned, 7,764. The addition to the population of London in the last year reported by the Registrar-General is 44,459. The years are not identical, but the average will not be very materially affected by that fact. We have seen that the figures before us give a density of 6·6 persons per house as an average for the metropolis. But the comparison of the supply and demand for a year, or of the number of new houses with the number of new inhabitants, gives a density of only 5·7 souls per house. It therefore seems that, notwithstanding a decrease in the activity of the house-builder of about 25 per cent. as compared with an average of twenty-five years, the increase of accommodation is still in excess of the increase of persons to be accommodated.

It is no doubt the case, that the houses recently added to the metropolis are, as a rule, larger and better than those of earlier date. But this remark rather applies to reconstruction within London itself than to the enlargement of the City by addition to its outskirts. It is impossible to leave or to enter London by either of the great railway routes without becoming painfully aware of the miserable rubbish that is being piled up under the name of house-building. In all those solid and substantial structures which are being raised in the better-known parts of the metropolis it is plain that accommodation is given for a larger number of inhabitants than was the case in the smaller houses that have been pulled down. There is thus a double movement in progress, which it is highly important correctly to gauge. Where the Artisans' Dwellings Improvement Act is brought into operation, as in the case reported a few days ago with reference to the Whitechapel District Board of Works, the number of inhabitants per house must be expected to decrease; on the other hand, where larger buildings replace smaller ones, that proportion will increase. Two modes must be adopted for gauging accommodation: one is that of the accommodation measured on the plan; another, that afforded by the cubic contents of the house. In the more costly and permanent structures which are everywhere dis-

placing the old cottage and small house building of the earlier part of the present century, much more house-room is afforded on the same acreage. Therefore, while the houses themselves are made incomparably more healthy for the occupants, there is at the same time a tendency to bring more inhabitants on to an acre of land, which has a contrary influence. The area as to which the inquiry referred to took place was stated at 6¾ acres, on which stood 444 dwellings, containing 4,350 occupants. This allowed nearly ten occupants per dwelling, and 644 inhabitants to the acre. If we subtract 20 per cent. from the acreage for streets, yards, &c., we find that each house covered on the average something close upon sixty superficial yards, giving only about six yards of area per inhabitant. In some of the courts the density is so great that Dr. Liddle says it allows only 3½ square yards for each person, as compared with 26 square yards, the average for the whole district. It is thus evident that in speaking of the average number of occupants per house, we are hardly aware what is meant, unless we also know the area occupied by the house, and, not only the area, but the number of floors. For it must be supposed that hardly less than three stories can be allowed even to the miserable dwellings in question. And although the height of each story may be, and probably is, cramped to the most necessitous and disastrous extent, still this correction will increase our six yards to 18 yards, and the 3½ yards of Dr. Liddle to 10½ yards. But even with this correction the density is something appalling. The average density of the population of the London of the Registrar-General for 1875 was 44 persons per acre, having risen from 25 persons per acre in 1841. The density of the population of England and Wales is such as to give 1·71 acres of land per head (taking the figures for 1869). Thus the density of the Whitechapel district in question is eleven hundred times as great as that of the average of England and Wales. Small wonder that the death-rate was as high as 41 per 1,000. In the Peabody-buildings, in 1874, it was 17·4 per 1,000, although in these buildings the density per acre of land is of course very considerable.

It is hardly possible to hold to the dry details of statistics when drawing the veil from a scene of degradation and misery such as that described by the Whitechapel medical officer, and often visited by ourselves. But it is not our present purpose to dwell on this aspect of the question. What we chiefly wish now to bring out is, first that the number of persons per house is not a sufficient guide to the inquirer, unless we know better the area and the cubic contents of the house in question; and, secondly, that, while making a very great improvement in house accommodation, in which, by raising more lofty structures, and substituting six or eight planes of abode for the two or three of old London, we are, to some extent, running into one evil while trying to avoid another; and increasing the density of our population per acre, at the same time that we are providing a more adequate amount of space for the daily living-rooms of the individual.

The question, then, will arise, whether the check that we have seen to have been given to the very rapid increase of London arises merely from financial causes, or whether it furnishes any indication that the pressure of population upon area has become so intolerable as to have become to some extent its own corrective. That something of this nature must, sooner or later, be the case, there is every reason to anticipate. In the City proper, or, at all events, in those portions of the City which are the very *foci* of the business of Europe, an action of that kind has long set in. The night population of the City is very small in proportion to its day population. Crowding like honey-bees into a dense mass, during the few hours of business, the merchants, bankers, brokers, and thousands of business men of London rush off into purer air to dine (their ancestors would have called it supping) and to sleep. The possibility exists that this action may spread over other parts of the metropolis. It is not, however, so simple a matter. Much depends on the nature of the daily occupation. Where night is turned into day, as it is in the Houses of Parliament, the distribution of the senators over a reasonable area, when the work is done, is out of the question. Members of Parliament must sleep within a cab-drive of the House; and any artificial and unhealthy occupation, such as debating by gas-light eminently is, has a tendency to aggravate its own evil by accumulating subsidiary evils around it. For every man who must sleep five nights out of the week, for six or eight months out of the year, within a limited range from the clock-tower of the Westminster Palace, how many servants, tradesmen, tradesmen's servants, and so on, in every ramification, are chained to the same area?

One element in the problem that is thus dimly sketched out for solution is, of course, the accommodation afforded by the metropolitan railways. In this respect we regret to see that a spirit of red tape has been allowed to obstruct that freedom of action which is at once essential to the proper conduct of an immense passenger traffic, and most conducive to the real interest of the passengers themselves. It is probable—indeed we suppose that we ought to say it is certain—that the officials of the Government have only carried out the actual law. But this is not all that the country has a right to expect from its public servants. The Board of Trade has interfered, to a certain extent, with the control of the railway proprietors over their own lines. It is, there can be no doubt, wise and right, in the interest of the public, that a power of this nature should be attributed to her Majesty's ministers. But that prime condition of the public interest should not be lost sight of. In the recent trial there was too much of the appearance of the Government, on the one hand, striving to screw the utmost farthing out of the companies—entirely without regard to the public convenience—and of the companies, on the other hand, threatening to inconvenience the public by way of retaliating on the Government. Both courses would be reprehensible; but by far the heavier blame lies at the door of the Administration. For the encouragement of third-class traffic, such traffic has been exempted from the duty on passengers. But, in order to protect, as it was supposed, the third-class passenger, and to study his convenience, the proviso was introduced in the Act of Parliament that such duty-free trains should stop at every station. In the enormous third-class traffic which has grown upon the Metropolitan Railways, it has become of essential importance that third-class trains, running from a central station like Moorgate-street to some place outside the dense parts of London, should run direct, and should not waste the time of the passengers by unnecessary stoppages on the way. Such trains were duly organised; when lo! in steps the tax-gatherer, and demands his five per cent. on their receipts. Now this proceeding, however it may be according to the letter of the Act of Parliament, is in plain violation of its spirit, and contrary to public policy. It was therefore the duty of the Board of Trade, so soon as they found where the shoe thus unexpectedly pinched, to propose a Bill to set the matter right; or, at least, so far to untie their own hands as to give to their own consent to the running of such trains the force of a protective warrant against the imposition of the tax.

We are not entering into the subject either of the propriety of the tax itself, or of the propriety of the exemption. But, things being as they are, it is utterly indefensible that a company should be taxed 5 per cent. on the earnings of a train simply because they run it more rapidly, and more conveniently to the passengers, than they were originally compelled to do. And the case is of great importance as bearing on our present inquiry. The question of choice of residence for a working man is evidently one that is much wider now than was the case ten or twenty years ago. As regards the welfare of the great body of inhabitants of London,—not the working classes alone, but all permanent indwellers in the metropolis,—it is essential that the greatest possible freedom should be given to that choice. If by means of railway accommodation, provided at the cost of two-thirds of a million sterling per mile, a body of working men can be taken home into fresh country air at night, and brought back to the centres of their occupation, refreshed and invigorated, betimes in the morning; and if the reduced cost of rent in the country, as compared to that in London, is such as to enable the workman to pay for this luxury—and a precious and most desirable luxury it is,—it is the duty of every man who cares a pin for the welfare of his fellows to do all that he can to further such a movement. To strike the cost of such conveyance with a tax may be law, but it is neither justice, mercy, nor common-sense. Robert Stephenson, who knew well what the working man was, used to say that he hoped to see the time when no working man would be able to afford to walk. Such may now be said to be the case, and it is an evil bit of official red-tapeism that comes in to check the facilities afforded for the transport of the workman.

In the cases of two great divisions of the busy inhabitants of London, the City men of business proper, and the workmen who show a tendency to mass in colonies, we can thus trace the operation of causes likely to check the immediate increase of London proper. To what extent these causes may act is as yet in the future. What will be the effect of surrounding an area covered with streets and squares with a ring of less dense abode, but still of urban rather than of rural physiognomy, has also yet to be seen. Private opinions, and even individual energy, can do but little in such matters. Great social movements, changes in class habit, displacement of centres of habitation, follow laws which we may attempt to discern, but which we have little power to modify. What we can do, and what we ought to do, is to prevent the natural course of things from being checked or distorted by artificial interference. If the workmen wish to go into the suburbs, and if the railway companies are ready to take them there, evil will betide the man who steps in with a red tape barrier.

It should be remembered that another cause, on which we have not touched, may have much to do with the check that the returns of the Commissioners of the Police show to have taken place in the building of London. The falling off from more than 16,000 to less than 8,000 houses built in a year has been coincident with a systematic attempt to prevent the workman from doing more than a fixed quantity of work. Into that we have not now space to enter. But we cannot fail to remark that a policy which is based on the idea that the demand for houses, or for any other produce of labour, is a fixed quantity, independent of the facility with which the demand is met, is a miserable fallacy. The good salesman will empty his shelves, while the surly or lazy salesman will drive customers from his shop. Nor is it only that the latter will change their market. They will buy less than they intended, as in the other case they will buy more. So even in householding there is an elasticity which can be encouraged or repressed by the conduct of the builder. People will stay in lodgings or take houses, will live together or set up establishments of their own, very much as they may be induced or otherwise by good and tempting accommodation. It is even possible that the strikes in the building trade, acting on this elasticity, have been the main cause of the decline in the number of houses annually built. As to that we reserve judgment. But when we see how the diminished number of new houses is accompanied by a diminished number of inmates per house, it is evident that some very powerful cause or causes have been at work to check the increase of London. And it is abundantly clear that any idea that a certain amount of building must go on, and that, therefore, men may ask as much wages, and work as short time as they like, secure of steady employment, is a delusion inconsistent with common sense.

ARCHITECTURE AT THE ROYAL ACADEMY.*

AMONG public buildings illustrated in Gallery IX., we are bound to give the first mention to the drawing of the new Opera House on the Thames Embankment (1086), as certainly the largest and most important recent public building, though any detailed description is unnecessary at present, as we gave an illustration of it some little time since. It would be gratifying if one could find in this large building, to be placed on what may truly be called one of the finest sites in Europe, and claiming specially to be the "national" home of lyric drama, something like a new architectural treatment of a great theatre; but we are bound to say that this is not the case, although it has been considerably improved in some respects since we published the first design. The main external treatment is still too obviously traceable to the Paris Opera House. The best point in the exterior is the treatment of the flat block of building which intervenes between the stage and the auditorium portion.

For the rest, civil architecture is not strong in the present collection, if we except the presence of a perspective view of the Natural History Museum at South Kensington, which has been illustrated in our pages, and has now arrived at a stage at which it deserves comment

* See p. 399, *ante*.

rather in reference to the building itself than to a water-colour view of it. It promises to be a fine structure. Among smaller works of a more or less public character is the interior of the ball-room at the Star and Garter Hotel, Richmond (978), which, as our readers will remember, for we have given a view of it, is a handsome room, with some originality in the treatment of detail, not in the most refined manner. The "Warehouse," in Chandos-street (990), designed by Mr. Meeson, has also been illustrated in our pages. We next come to a design of some specialty of purpose and interest, that by Mr. R. P. Spiers, for a memorial tower in Locke Park, Barnsley. There is something new in this, which is a design Classical in detail, and consisting of a circular tower, the lower portion of which is surrounded by a circular columned loggia, with a flat roof and balustrade round, giving a base to the whole. Whilst the general idea is original and suitable for the purpose, the details seem to us out of proportion; for instance, the exceedingly heavy cornice and frieze at the top completely over-weights the pilasters beneath it; a solid wall beneath would have given a very different effect. We cannot but observe also that it is extremely unfortunate, to say the least, that a drawing by the architectural instructor of the Academy, and hung on the line, should show such inaccuracies in the perspective, many of the curves being completely broken-backed, and as if put in anyhow. Mr. Spiers has made so many capital drawings of other people's work, ancient and modern, that it seems extraordinary he should have done so little justice to his own. Mr. Bickerdike's "School Buildings, Westminster-bridge-road" (1,031), is a specimen of a building picturesquesly treated, and in which the picturesque element seems to grow naturally out of the requirements and arrangement of the interior; it is in geometrical Gothic style, a "mode" which is now almost becoming a rarity. "Lincoln County Hospital" (1032), by Mr. Graham, is a fine pen-perspective of a pronounced Queen Anne building, with all those rude quaintnesses of manner, long strips of brick pilaster, &c., the interest of which is purely sentimental, and which make the whole a sort of travesty of architecture, demanded by the fashion of the day only. The revival of "Classic" in one shape or another we have long expected and foretold; but this kind of thing is a mere reproduction of a debased treatment of Classic with a mixture of the remnant of Gothic feeling, a style destitute of logic and refinement, the taste for which is giving rise to buildings which will be wondered at in a score of years hence. However, there is evidently no stemming the tide at present. Mr. Tasker's "Monastery at Highgate" (1,048) is gloomy and prison-like enough in aspect to form a fitting object for the invectives of Mr. Newdegate; its suggestions in regard to style seem to come from the Spanish peninsula; there is character and originality in the building, with its heavy overhanging roof, though it is delineated in a rather bald and scratchy drawing. The drawing of the Holborn Viaduct Station and Hotel by Mr. Isaacs (1,075) exhibits some very good treatment of old and well-known features; it is a Classic building with pilasters running through two stories, but the windows and panels between the pilasters are so designed as to appear to belong to their situation, and there is a more homogeneous effect about the whole than one generally sees in designs of this type; the attic story, with its short coupled fluted columns, is elegant also. Mr. Aitchison's elevation for "proposed Founders' Hall, St. Swithin's-lane" (1,083), is, we presume brick and terra-cotta, but the flat heavy red tint of the drawing hardly realises the effect; there is a good deal of refinement about the design, which is Italian in feeling, with a continuous bas-relief in terra-cotta carried across at about half the height; the foliated or scroll ornaments beneath the first-floor windows and on each side of the dormers seem rather too large in scale, for that class of ornament. Mr. J. O. Scott exhibits drawings of design submitted in competition for the Examination Schools at Oxford (1,085—92), the "Waiting Hall" is a good vaulted interior; the quadrangle is a satisfactory reproduction of late Gothic. Mr. Hicks's Masonic Hall at Redruth (1,077) is "nineteenth-century Gothic" both in its faults and its merits, the latter predominating; the treatment of the porch is good and effective. We must not pass over the "Chauncey Hare Townshend Schools" (1,018) now being erected at Westminster from the designs of Messrs. E. Scott & Hyde, a building which, though not strikingly original, is in remarkably good taste, and looks precisely like what it is meant for.

Among domestic buildings, of which there are a good many specimens, "Queen Anne" has it all her own way; in fact, there is very little else. The most important exceptions are the two buildings of Mr. Norman Shaw, "Wispers, near Midhurst" (1,045), and "Pierrepoint, Surrey" (1,065). Mr. Shaw is fortunate in pretty often getting that most suggestive kind of site, the side of a hill, to exercise his taste for the picturesque on. "Midhurst" is a charming example of this; a house situated on the side of a wooded hill, the lower front (shown in the drawing) giving the opportunity for getting a good solid basement of masonry, on the top of which the architect plays with his design as he pleases, in that studied and curious irregularity the spirit of which he has so thoroughly mastered. Still, in despite of the advantage of site in this building, we are not sure that Pierrepoint, in its flat garden ground, is not an even better instance of its author's talent in evolving the picturesque out of simple materials. The long side of the house next to us, with its simple repeated vertical timber framing, its over-hanging gabled story, and the seemingly accidental break in the line by which half the front is put at a slightly different angle to the other half, is quite a study of quiet homelike repose of effect. The bit on the right, too, the solid mass of wall flanked by three thick buttresses, and pierced only by the two windows between the upper part of the buttresses, is what, if we found it in an old building, we should infallibly take out our sketch-book for. It is a difficult, rather a curious question, whether this picturesque-making of Mr. Shaw's is a true art or a pleasant "sham." Were the old houses which have the same sort of charm and picturesque suggestion,—were they put together at all with the deliberate intention of being picturesque, or is this quality merely the result of a natural and unsophisticated method of putting a building together almost irrespective of appearance, or, at least, symmetry, and just as the materials and the nature of the site seemed to suggest? Some of the critics who are most listened to in the present day would say that undoubtedly the latter was the true state of the case; but it is difficult to be quite so sure of that. If this method of building produces such pleasing effect now, it may be stretching a point too far to say that the ancient English houses in a somewhat similar style were not deliberately intended to please the eyes of those who built them, or that they were no more to their builders than the modern brick street house is to its builder and its tenant,—a place to live in, and nothing else. In regard to this question, how far this modern picturesque is a real pleasure, how far it is merely one of association, Mr. Shaw's designs suggest an annual puzzle to the critic, at the same time that his drawings, as drawings, are certainly an annual pleasure.

Among the one or two other domestic designs which are not Queen Anne, two houses by Mr. Salman, both in the *quasi*-cottage style (1,000, 1,005), are very pleasing,—red brick houses in a Domestic Gothic style, with black and white work in the gables; No. 1,005 looks exactly like an old English country-house or farmhouse, even to the green moss-covered roofs, which go to help the effect, and show the dwelling as it would be when time has toned down the rawness of a new building. The landscape is very agreeably treated here, and the drawing in general has a feeling and tone superior to the ordinary "architectural draughtsman's" style. Of the Queen Anne houses which abound, it is difficult to say anything special, as they all seem made up out of the same sets of features, variously arranged. In Mr. Robinson's design for the northern block of houses on the Hans-place estate (1,025), the ground story is the most characteristic portion, with the line of the stone balcony carried straight across, and supported in the recessed portion of the front by heavy stone corbels. Mr. J. J. Stevenson's design for houses partly on the same estate (1,029) has much the same characteristics, put together with rather more aim at irregularity and picturesqueness of effect. Messrs. Batterbury & Huxley send four elevations of a house with studio attached at Haverstock-hill (1,326), in which they have succeeded to a curious degree in imparting the look of a model or a piece of furniture to the design of a house. What there is in this to repay the labour of drawing which has been bestowed upon it we entirely fail to see; though we approve of geometrical drawings being sent to the architectural room, and for that reason as well as others approve of Mr. Gibson's section and elevation of staircase at Dobroyd Castle (1,041), in which, however, the style of the masonic part of the detail does not commend itself so much to us as the management of other parts,—the ceiling and lantern, for example. "Additions made and contemplated at Wilmshurst, near Uckfield," by Mr. S. J. Nicholl (1,058), is a very pretty and rather original bit of building; the open recess or alcove with the central arch has a very nice effect.

Among the not very numerous drawings of decorative work it is a pleasure to mention those of Mr. Aitchison, who seems to have established himself as a designer in this kind of work, and whose productions are always marked by delicacy and refinement of feeling both in regard to colour and design, and are totally free from that tendency to over-pronounced effects and angular jerky lines which is so common in decorative work at present. His principal drawings represent decoration of a drawing-room at Brighton, and a large drawing-room at a house at Prince's-gate (1003, 1009); the former room is divided into lengths by a soffit across the ceiling, the larger portion being treated with a wainscot of a dark neutral grey picked out with white, and the wall above with a light conventional foliage design in large panels: as a piece of harmonious and yet slightly piquant contrast this is very effective. The larger drawing-room design has a black (ebonised?) dado, with panels broken up by conventional foliage, a gold paper over, and a "classical" frieze of arabesques, griffins, &c.; a little old-fashioned this last, but the effect of the whole is admirable. The same architect exhibits also two pieces of simple decoration for rooms for H.R.H. the Princess Louise. Mr. W. Clausen, in a beautiful coloured drawing (1,022) shows a proposed decoration of a dining-room, in heavy panelled wood wainscoting, with figures of "the Months" in long panels on a gold ground; which figures are designed with much spirit and variety of pose and character. Mr. Talbert sends a very fine perspective pen drawing of a staircase, in which the form of the heavy wood angle newels is repeated, as a portion of the (apparently) stone piers of the open gallery at the top, which seems a little questionable; the general effect is rich and massive, notably the elaborate carving in the wooden wall lining to the right. Mr. Poley's decoration for a dining-room (1,082) and Mr. Campbell's design for billiard-room decoration (1,034) both seem very good, but, as we have before observed, flat geometrical drawings in pen and ink only, without any hint of colour, are not the best method of exhibiting or testing the merit of a decorative design, however fashionable they may be among draughtsmen at present. The drawings for stained-glass windows for Clarence House, by Mr. F. Smith, are well-designed figure subjects in themselves, but not in the true style for stained glass; the colour is not agreeable, the designs are too pictorial, and the leadings are not shown.

Of the drawings illustrative of existing architecture, the most important certainly is the fine water-colour drawing representing part of the arcade of the large courtyard in the palace of Tiroomal Naik, at Madura (980), by Mr. Chisholm, who is restoring it, and, as will be remembered, read a highly interesting paper on the subject to empty benches at the Institute a short time since. The drawing shows well the remarkable semi-Saracenic detail of the building, and the effect of the details under the glare of the Indian sun. It is remarkable how curiously some of the details remind us of Gothic work: for example, the foliage ornament in the second arch from the left-hand of the drawing, which has very much the appearance of a bit of oak-leaf ornament of the Late Decorated period of English Gothic. Mr. J. Crowther's drawing of the tombs of the abbots in Westminster Abbey (979) deserves high praise for its broad style and handling, and the truth of tone in the rendering of the venerable old masonry and sculpture. Mr. Spiers's small drawing of part of San Giovanni, Siena (989), has a tone and individuality of its own. Mr. Langham's drawing of the Old Hall at Kirby, Northamptonshire, is a most carefully-fininished pen-drawing of a most interesting and picturesque bit of Jacobean work; the pediment over the gateway especially, with its row of decorative wall-shafts, is curious and effective, and looks like a Gothic notion in decoration re-appearing in another style. The Old Hall at Gainsborough, Lancashire, by Mr. Codd, is a very

odd and quaint jumble of manners and styles in an old tumble-down bit of building. On the whole, the illustrative department of the Architectural Room is by no means the least interesting portion of the collection.

THE ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE annual general meeting held last Monday for the purpose of receiving the report of the Council, together with the balance-sheet of receipts and disbursements for the year 1875, was attended by a comparatively large number of Fellows. According to the phraseology of the notice-paper convening the meeting, not only "the president, council, and secretaries," but *also* the "honorary officers of the Institute and examiners under the Metropolitan Building Act" were to be elected for the ensuing year of office. Necessarily the Associates, who have no power to vote, or even interfere in the affairs of an election, were very sparsely represented, although several members of the junior class are older and better known than some of the recently appointed office-bearers. The proceedings of the evening were both lively and harmonious. The minutes of last year's meeting were read in a subdued tone by the secretary amid a sustained conversation of gentlemen too glad to see each other again to be desirous of hearing a long account of the little that was effected at the preceding annual gathering. The vitality shown this year to be still in existence among the general body may, perhaps, induce them to do next year what the Council has long done for them. For several sessions the election of officers has consisted in the acceptance by a small number of members of certain names suggested by the Council. The method of their election is so hedged in by convenient and plausible restrictions as to render opposition difficult if not impossible, without resorting to the procedure, somewhat alien to English custom, of a cabal. The independent addition by Mr. Wyatt Papworth and Mr. G. W. Mayhew, of one name to what is known as the "house-list," afforded an opportunity of choosing between two at least of those gentlemen who submitted to the amiable infliction of a ballot. Suffice it, that during the proceedings, Mr. Charles Barry took the chair of the Institute, vacated by Sir Gilbert Scott, R.A. The bye-law which enacts that one of the three vice-presidents must retire every year, enabled Mr. Talbot Bury to succeed to the vacant post. Messrs. Anderson, Brooks, Cates, Chambers, Cundy, Hansard, Phipps, Knowles, Plumbe, Pullan, Seddon, and Mr. James Edmeston were elected Town members of Council. Of the Country members who sat on the Council of the past session, not one had attended a single meeting, and this fact disqualifies them from continuance in office. Their places are now taken by three practitioners from Dublin, Glasgow, and Gloucester respectively. The auditors—a Fellow and an Associate—for the year just commenced are Mr. Alfred Strong and Mr. Meeson.

The Report of the Council having been taken as read, gave an opportunity for comment, although its judicious wording afforded none for opposition, before it was unanimously adopted. The unusual retirement of so many as eleven members raised a very natural question, the reply to which was evaded with characteristic caution. The losses occasioned by the deaths of others are also unusual; but a possible explanation of both is easy to give. In the roll of foreign corresponding members the death of Henri Labrouste, member of the Institute of France, leaves a vacancy difficult to fill. That of Sir Gardner Wilkinson, F.R.S., causes an almost similar void in the list of honorary members. The paragraph in the Report which alludes to the award of the Queen's medal to M. Duc, architect for the Palais de Justice, Paris, records an incident as just as it is popular, and needs no reference in addition to that already made within the rooms of the Institute and more fully treated in our pages.

The balance-sheet elicited some amusing criticism from Professor Kerr; and the innocent hope, hidden in a modest foot-note, that the accumulated interest on the "Travelling Fund," which is now about 20*l.*, would soon cover the annual money prize of 50*l.* for the Soane Medallion, was treated by the Professor as a fair specimen of official capacity for complicated calculations. The repayment of 190*l.* to the Library fund was passed over without either suggestion or sympathy. The fact is, that one of the best technical libraries in the kingdom, like many other similar things in it, is maintained by voluntary contributions, although a portion of the fund devoted to it is nominally compulsory. A bye-law says that "All members, whether Associates or Fellows, are expected within twelve months after their election, to deliver an original paper to the Council on some subject connected with architecture, or to make a donation to the library or collection." Some other method of supplying the library with books lies conveniently open for the members' suggestion. The recent experience of the Sessional Papers Committee shows that there is not any extraordinary difficulty in obtaining papers if they be but sought for in the right way with a little personal zeal. Nor have this committee confined themselves to merely seeking for papers. From their discussions have emanated several suggestions for the better conduct of the ordinary meetings; but the Council to whom these suggestions are officially presented by the secretary have been compelled to shelve them, in consequence of the press of more important business. For our own part, and for the sake of the authors also, we cannot but regret that these papers should appear in our columns in the form under which they are perforce printed. Only a certain abridgment of each is permitted; and often a valuable contribution to professional literature, indistinctly heard at an Institute meeting and rendered unintelligible in a too condensed shape, is completely forgotten before the "Transactions" are sufficiently "purified" and corrected to admit of distribution among the members.

The foreign correspondence of the Institute of British Architects offers promise of possible improvement. It was once the strong point of the Society; but donors are less liberal than of yore, and the titles of foreign books have been seldom communicated to the meetings this year, doubtless because the donations are less numerous than in the previous session. In the list for 1875 the corresponding members were largely composed of names whose owners' continued existence was sometimes taken for granted. Until very recently it was attempted to persuade British architects that although Prussia was in Germany, Saxony and Bavaria were distinct kingdoms; and that "in erring reason's spite," three Italians remained faithful to them in the States of the Papal Church! Slight as such errors are, they afford a handle to those who delight to find fault. A committee composed of men who have travelled, and who travel, has already been suggested as likely to give desired assistance to Mr. Cockerell in the future labours of his post. Many would covet the honour of serving on such a committee. The several members might take special duties connected with different parts of the Continent; and, by keeping up a constant supply of information, become a means of intercommunication between the English profession and its foreign colleagues. Nor should the list of honorary members be allowed to remain in its present scanty condition. A number of archæologists and engineer-officers at present hard at work in India should be invited to swell it; while the addition of gentlemen of the medical and other scientific professions, whose labours often lead them to the confines of practical architecture, could not fail to produce mutually satisfactory results.

The question of the Architectural Examination was touched upon by Mr. Dawson. It appears that in the course of an entire session the Examination committee have decided to "shortly take the matter in hand." The receipts show five students at a guinea a head, and the amount derived from fees of candidates and examination rules is 45*l.* The whole cost is more than 100*l.*; and it is argued that an examination which is supposed to lead to the acquisition of a diploma, and yet does not pay its expenses, ought not to be relegated to the domain of charity. Nevertheless, it is worth a little speculative expenditure. It has cost some pains in the present century to redeem the profession of architects from the slur attached to it in the last. Addison meant no satire when he wrote in imitation of Martial,—

> "If of dull parts the stripling you suspect,
> A herald make him, or an architect."

When fools were sent to sea, and rogues learnt discipline in the ranks of the army, dullards were said to be fit stuff with which to solve architectural problems. It is worth some little application on the part of young men to show themselves worthy to belong to a craft which the technical writers of every age have delighted to honour. Attention to the wishes of the students themselves and some certain assurance in the prospective advantages of examination would, we are convinced, be followed by increasing success.

The delicate matter of the secretaryship was once more calmly discussed last Monday, at an early period of the evening. A short time ago some feeling was naturally evoked by the attempt of a special committee to destroy the original charter. But this document was suddenly discovered to be so elastic that the present paid secretary was said by witty opponents to hold office in defiance of it. It is now no secret that one of the sub-committees appointed to propose measures for the improvement of the Institute has received a carefully prepared series of suggestions from a Fellow, one of which advocates the reappointment of a second honorary secretary in accordance with the provisions of the charter. This does not imply any alteration in the salary or even functions of the present paid officer. It simply tends to deprive him of the permanent vote which he now holds as an *ex officio* member of the Council,—a distinction enjoyed by no other member, from the president downwards. The protest just made, amid applause, by another member,—a tried supporter of Professor Donaldson,—is of a similar description. Preceded by an assurance that immediate action would not be taken, it was ultimately withdrawn on the promise being given that it would be considered by the sub-committee specially engaged in the discussion of such matters. The protest was levelled at the present mode of administration. This mode, not from any fault, any want or excess of zeal on the part of the secretary, but rather, from the reticence of the general body is said to partake of a too personal or individual character. Honorary officers, whose work, if properly done, is laborious, seem glad to have been relieved first of trouble and then of responsibility by a valued assistant, who in spite of himself has become almost a managing director. Never, however, has the secretary's legitimate work been better done than at the present moment. He may justly complain of having too much thrust upon him; and at times he is compelled, when a meeting of certain committees is requested by some of the members, to decline or defer the duty of calling it. While there seems to be no disavowal, on the part of anybody, of the services rendered by Mr. Eastlake, a conviction gains ground that the re-appointment of a second honorary officer would be beneficial both to the Council and the general body of members.

It would be ungracious to close a notice which registers the departure of one and the advent of another president without some mention of the former, even did he enjoy a reputation far less deservedly brilliant than that of Sir Gilbert Scott. It is gratifying to remember that he entered office under the weight of physical suffering, and that he leaves it in excellent health. During the last two years he has rarely missed taking the chair at the ordinary meetings. Seldom speaking at the beginning of a discussion, he always had something new and to the point to say when at its close the subject seemed exhausted. We trust that Sir Gilbert's portrait, well and faithfully painted, will soon help to adorn the walls of the Institute; and that he himself will long continue in various ways to assist and instruct his less gifted brethren at their periodical *réunions* in Conduit-street.

ROYAL ACADEMY CLUB.

THE annual dinner of the Royal Academy Club was held at Greenwich on Monday last under the presidency of Professor E. M. Barry, and nearly sixty of the members and their friends were present, including Mr. E. B. Stephens (its active secretary), Mr. Frith, Mr. Horsley, Mr. Charles Landseer, Mr. Ansdell, Mr. Durham, Mr. Calder Marshall, Mr. H. S. Marks, Mr. Dobson, Mr. T. S. Cooper, Mr. T. Faed, Mr. Lumbe Stocks, Mr. T. Hills, Mr. Val. Prinsep, Mr. Fildes, Mr. Godwin, Mr. Waterlow, Professor Parkins, and others. The chairman, in proposing the customary toast, "Honour and Glory to the next Exhibition," interested his hearers with the intelligence that the clause of the Chantrey bequest, which calls upon the Council to spend annually a considerable sum of money on the works of a painter or sculptor, to be afterwards placed in the National Gallery, will be brought into operation next season. Mr. Fildes replied for the exhibitors not members of the Academy modestly and well, and several other agreeable speeches were made.

TELEGRAPH CONSTRUCTION.

So many things occur which remind us how much we are dependent on the working of the electric telegraph that, although few of us may be able to conceive its mode of action truly, we find it interesting to acquire some little knowledge of the subject beyond what we can understand from seeing the instruments and the wires, and talking vaguely about "the electric fluid"; and there is no book more instructive on the subject than that which forms one of Messrs. Longman's Text-Books of Science.* Whether electricity be a fluid or a force, whether it be a form of matter or a form of energy, the authors do not discuss; the terms used are rendered independent of theory. The nature of electricity is not known, nor is it, say the authors, necessary to the telegraphist that it should be known by him. Electricity is as universal in its effects as are heat and light. We are cognisant of its existence, but we do not know its particular form any more than we know that of heat or of light; and we can measure its quantity no more definitely; we have a fierce heat or a gentle warmth; a brilliant or a moderate light; and we have an amount of electricity which fuses metal or gives pleasure to our sense of touch; and so there is electric quantity, but it is a quantity of relative magnitude only, as in light when we say that a gas-jet is equal to a given number of sperm candles, or that a temperature is of a given number of degrees. Electricity is transmitted through bodies, with more or less ease as they are better or worse conductors, and is capable of doing work by overcoming obstacles to its progress, and the amount of work done with a given electro-motive force depends upon the resistance to be overcome, and resistance implies that quality of a conductor, in virtue of which it prevents more than a certain amount of work being done in a given time by a given electro-motive force. Those bodies,—as glass, ebonite, or air—which offer great resistance to the passage of electricity are called insulators, while those which offer very little resistance—as the metals or water—are called conductors; but the difference in the terms is one of degree only. That function of electricity which determines its motion from one point to another is called its potential; and it is somewhat analogous to an excess of heat in one part of a body over the degree of heat in another part; thus, if one end of an iron rod, of equal temperature throughout, be placed in the fire, the heat travels along the rod with a force in some measure proportionate to the difference of temperature between the two ends of the rod; and the difference of potential between two points determines the amount of the electro-motive force; and what is called a current is an apparent transference of electricity from one point to another to produce equalisation of potential. A current always is supposed to flow from the point of higher potential to that of lower potential. The former point is taken to be positive to the latter point; and, *vice versâ*, the lower point is taken to be negative to the higher point; and the current is supposed to flow from the body positively charged to that negatively charged. The potential of the earth is assumed to be zero, so that when we speak of the potential of a body we really speak of the difference between its potential and that of the earth. This does not assume that the earth has no potential;—different portions of the earth's surface have different potentials at different times. A circuit is the whole path along which the electricity is supposed to flow along the material conveying it, whether that be earth, air, water, or matter in any form. If we stretch a wire horizontally above-ground, and connect its two ends with the earth, then the whole path from one end of the wire to the other and back again through the earth is the circuit, and this circuit may either have a current of electricity flowing through it, or it may be free from all current. In the latter case the circuit is said to be open, in the former case to be closed. The earth is considered simply as a part of the circuit, offering a certain resistance to the flow of electricity through it, and whatever offers resistance to the passage of the electricity, whether it be the battery which generates the current, or the apparatus which renders it evident to the senses, or the line-wire, or the earth, is the circuit. The various kinds of batteries and instruments are described, with relays, recorders, and telegraphic apparatus, with the systems of working; the sixth and seventh chapters being devoted to construction; after which the authors treat of faults, testing, and commercial telegraphy.

It appears that roads and railways are preferred to canals as overground telegraph lines, and that it is not easy to say whether the road or the rail is preferable, but that either is preferable to underground or covered wires, for not only is the first cost less, but faults occurring upon them can be far more readily traced and rectified.

The telegraph-poles used in England are generally of larch, 5 in. diameter at the top for the minor lines and 6 in. for the trunk lines, except terminals, which are of squared timber. The larch and Scottish fir are felled in October and November, and are required to possess the natural butts. The age of the tree when cut ranges from twenty-five to fifty years, and varies according to the soil upon which it is grown. Its average life as a telegraph-pole—if it has undergone no preparation to prevent decay—is stated to be about seven years, but varying according to the nature of its parent soil as well as of that to which it has been transferred. The wet rot to which it is subject is of two kinds, chemical and mechanical. Under the influence of heat and moisture the albuminous and nitrogenous materials of the sap ferment, and decompose the cellulin and lignin, and by a gradual process of oxidation the pole slowly rots away. But it is to the mechanical kind of wet rot that the decay is mostly due. The varying conditions of moisture and temperature are mostly felt at the ground level, between wind and water. To prevent this poles are subject to various processes before being planted; that of charring consists in gently roasting the butt end of the pole, after having been well seasoned, for a length of about 6 ft., over a slow fire, and removing it immediately the surface becomes well blackened without being burnt. The object is to expel whatever sap remains, to kill whatever animal or vegetable life may be present, to prevent absorption of moisture by destroying the external pores of the wood and substituting an impervious covering in their place, and finally to surround that portion most liable to decay with a powerful antiseptic in the shape of charcoal. The bottom of the pole, as well as the portion which has been charred, should then be well coated with a mixture of three parts of Stockholm tar to seven parts of gas tar well boiled, and three parts of slaked lime added, care being taken to scrape off, before the tar is put on, any part of the wood which may have been burnt during the process of charring. Various other means of preventing decay are mentioned in the little book under notice, and their success described. It appears that several poles which were erected between Fareham and Portsmouth in 1848–49 were examined in 1874 and found, to all appearance, to be in as good a state of preservation as on the day when they were first planted. This is a remarkable instance, but it accords with nearly all the evidence we have of the result of the particular process named. In countries where wood is extremely perishable, either from natural decay or from the attacks of the white ant, and preservative processes, on account of their expense, cannot be introduced, as well as where the means of transport are limited, iron uprights are used. The tubular pole invented by Messrs. Siemens, Brothers, is usually employed, and as a general rule its cost may be set down at about three times that of wooden posts of the same strength. Another pattern is that known as Hamilton's standard; and another, again, is that introduced by Mr. Oppenheimer, of Manchester, the especial feature of which is the cast-iron base, which is formed so as to be driven forcibly into the ground by a descending weight. The riband iron post of Messrs. Lee & Rogers, of Manchester, is another form.

The wire mostly employed in England for telegraph-work is, it is said, of the quality of soft iron wire known as "best best." There appear to be some ridiculous names of iron wire, as there are of plates and bars; there are best, best best, and extra best best; and charcoal wire, the best of all. Surely the makers or the merchants, or whoever gave these names to wire and other forms of manufactured iron, cannot reflect with any pleasure upon the occasions which have given rise to these pretended superlatives and super-superlatives, ridiculous as they are in every other sense than that of enabling manufacturers to gain some temporary advantage over the public and over each other.

It would appear that "best" wire is not good enough for telegraph purposes, for, in testing the strength, the scale begins with "best best," and goes on to include the two higher qualities; the three tables of strength given by the authors embracing all the kinds and all thicknesses of wire employed in telegraphy.

The material from which most of the insulators employed at the present day in England are formed is brown earthenware. It does not insulate so highly as porcelain, nor can it be so perfectly glazed, but it is produced with greater uniformity of quality, and its manufacture can be more thoroughly relied upon, and it possesses the further advantage of cheapness over porcelain, ebonite, or glass. The form of the insulator appears to be very important, and is drawn and described by the authors.

In digging a hole for a telegraph-pole its length must lie in the direction of the wires, and not across it, the object being to get the solid earth as much as possible to resist the lateral strain of the wires. Earth-borers have of late years been introduced, whereby no more ground is removed than is required for the insertion of the pole, but several disadvantages which they have are enumerated.

The depth to which poles are set in the ground is about one-fifth of their length; but the depth should never be less than 4 ft., and need not be more than 6 ft., in good solid earth, no matter what their length may be. In made ground they are planted 1 ft. deeper. The authors lay great stress upon the importance of punning the earth round the poles, and of sufficient time being given for this to be well done, for upon the punning and ramming of the poles being carried out as they ought to be, depend, to a large extent, the stability and good working of the line when once erected. The poles being erected, and stayed or strutted, the wire is stretched. The maximum tension with which wires are drawn is one-third of their breaking-strain. When this tension is employed, it is found that the dip will be about 24 in. in a span of 100 yards, and this is accepted as the standard by which all the wires are regulated, the temperature of the air being taken at 60° Fahrenheit. The dip for any other span may be calculated from the known property of the curve the wire assumes, which is that the dip of any span varies as the square of the distance between its supports; thus, the dip in a span of 80 yards would be 15¼ in., for,

$$100^2 : 80^2 :: 24 : 15\tfrac{1}{4}.$$

After describing the operations of binding the wires, jointing, terminating, and connecting the overhead wires with the earth, the various operations required in laying wires underground in pipes are described.

* Telegraphy. By W. H. Preece, C.E., and J. Sivewright, M.A. London: Longmans, Green, & Co. 1876.

DESIGN AND CONSTRUCTION OF DOCK WALLS.*

THE stability of a dock wall really depends upon its resistance to the thrust of the earth behind it more than upon its resistance to the pressure of water within the dock, and that is greatest when the dock is empty, and the wall is thus practically a retaining wall, and its dimensions must be determined with respect to its stability as a retaining wall under similar conditions of earth-thrust, although to a retaining wall a certain form is sometimes given which would not be the best for a dock wall; for, as Mr. Allen, the author of the book before us, says, "Dock walls may be said to occupy a situation intermediate between masonry dams and retaining walls, the former being built to support a pressure of water, and the latter to resist a thrust of earth. A dock wall has to perform both these functions." No doubt, in the case of an extension of the dock, whether that may be an increase of area or the making of a new lock—and these have been no very unusual circumstances of the growth of trade—it is of some advantage that the dock wall should be of such a form as to admit of its being temporarily shored up without difficulty; but otherwise a dock wall does not differ in its circumstances of stability from a retaining wall, the condition of the earth at the back being supposed to be the same in both cases.

It is well, however, and especially for the young engineer, to calculate the stability of the the wall under the pressure of water on the face as well as under the earth-thrust from behind.

The author's theories of stability are founded on successful examples in practice, and therefore

* Theory and Practice in the Design and Construction of Dock Walls. By J. Romilly Allen, Assoc. Inst. C.E. London and New York: E. & F. N. Spon. 1876.

may be relied upon; and it is not the results he arrives at, but his method, to which we wish to point attention. His proposition is that, "if a mass of fluid be at rest, any portion may be supposed to become rigid without affecting its equilibrium or the pressure of the surrounding fluid; for any portion of a fluid may be contemplated as a separate body, surrounded by fluid, which presses perpendicularly at all points, and its solidification will introduce no change in the pressures upon it, and therefore no change in the pressure at any other point of the fluid." Every one will agree with that statement, but not, we think, with this, that "This last proposition enables the laws of statics to be applied to cases of the equilibrium of fluids," and that "thus the pressure of water against the sloping face of a dock-wall is determined by imagining the prism of fluid lying vertically over the face to become solid, and then calculating the effect produced by its weight on the principle of the inclined plane without friction," and that "the pressure of water is thus reduced to a question of statics."

It is of the essence of the proposition that the rigid body be surrounded by fluid, whereas the author treats it as a solid resting, without friction, on the face or batter of the wall,—that is to say, that the wedge-shaped mass of water which lies between a vertical plane and the face of the wall is considered as a solid, the lower edge of the plane coinciding with the foot of the batter, or slope of the wall, and the upper edge with the surface of the water; and there is not supposed to be any water-space, however small, between the solid wedge and the face of the wall, whereas, the proposition, which in itself is true, assumes that there is such space, even though it should be merely a film of water, intervening between the two solid bodies; without this the pressure on the face of the wall would not be the same in the two cases, and, with it, the pressure would not be a statical pressure.

In one respect, indeed, a dock wall differs from an ordinary retaining wall, for it is always built in a low situation, and therefore difficult of drainage, and unless this be well provided for, the earth at the back of the wall becomes saturated with water, which increases the thrust on the back of the wall. Of the earth-thrust the author says:—"The tenacity of earth is so uncertain an element that it is neglected, and the body merely considered as a granular mass having friction between its particles. By a granular mass is meant a collection of very small solids more or less of the same size and shape, such, for instance, as a heap of sand or pile of shot. If dry sand be poured out of a vessel with a spout on to a flat surface it will form a conical heap, the sides of which will make a particular angle with the horizontal, and it will be found that the steepness of this slope can never be increased beyond a certain limit, however judiciously the sand be poured, or however carefully it is heaped up afterwards. This slope is called the angle of repose of the material of which the granular mass is composed, and varies for different substances, scarcely in any case exceeding 45°, and sometimes as low as 20°." It was, it is pointed out by the author, at first thought that the earth-thrust was produced by the whole wedge of earth between the back of the wall and the natural slope, or the slope of the angle of repose; but M. De Coulomb and M. De Prony proved mathematically that when a retaining wall gives way the earth does not break away along the line of natural slope, but along a plane of rupture half way between the back of the wall and the angle of repose, so that the earth-thrust is due to only half the wedge of earth between the back of the wall and the natural slope.

The maximum thrust, however, is found when the earth at the back is assumed to be so penetrated with water, either through the wall from the dock, or from the land side for want of proper drainage, as to be semi-fluid, and when it is treated as a fluid of the specific gravity of the earth; and it is the greatest possible thrust which should be calculated upon. It is possible, and is nothing more than ordinary practice, to make such provisions in the execution of the work as to prevent the earth at the back of the wall ever becoming semi-fluid, or anything approaching it; and to make it certain that the angle of repose of the earth may always be considerable. If it be thirty degrees, the pressure on the back of the wall is reduced to one-third of the greatest possible pressure; that, namely, of a fluid mass of the specific gravity of the earth; and according to the provisions which the engineer can or is willing to make in the execution of the work, the thickness of the wall must be calculated upon a condition of earth-thrust between these two extremes.

The weight of the wall exerts its own pressure upon the foundation, and the earth-thrust is also transmitted to the foundation of the wall. The point where the resultant of these pressures meets the base of the wall is called the centre of pressure. This must, in every case, be within the base, otherwise the pressure at the back would overturn the wall, and the stability is proportionate to the horizontal distance between the centre of gravity of the wall and the centre of pressure. Mr. Allen says the practice of English engineers in this respect is to make this distance one-fourth of the width of the wall at the base, and that the practice of the French engineers is to make it three-eighths. This is a very wide difference, and is an instance of how little mere figures can be relied upon unless their significance be duly considered, and all the circumstances be taken into account. The one is half more than the other, or 50 per cent. more, and so by the French practice there would appear to be a great saving of materials; or, is it that they are satisfied with a smaller margin of stability for safety than we are?

The author gives an instance of a dock wall at the Liverpool Docks, designed and constructed by Mr. Lyster, the height of which above the level which the author calls the "datum line"—perhaps the level of low-water mark of spring tides—is 27 ft.; its thickness at top being 6ft. 6in., and at the above-named level 12ft. 6in., the mean thickness being 9 ft. 10 in., which is considerably more than one-third of its height—more nearly 1-2·75ths of its height. In order to judge whether our practice of one-fourth, or the French practice of three-eighths, is preferable, we should know the form of the materials, whether of squared stone or rubble, or how much of each goes to make the wall, or whether the same form of materials—as brickwork—is used in both countries under the difference named in point of stability, and more particularly, perhaps, as to the nature of the lime or cement used. As, however, a second volume is to appear, devoted to the practice on the subject, these and other points may be stated; and in cases of this kind the best way is to give examples of successful construction with the least quantity of materials, and show how, by attention to details throughout, the quantity of materials used has been reduced to a minimum; for, granted only plenty of money and materials, we should have but little need of books on the construction of engineering works, but might go on for some time longer by rule of thumb.

FROM PHILADELPHIA.

IT is almost a foregone conclusion that the Centennial Exhibition will not be ready in all its departments by the opening-day, although great efforts are being made in that direction. The main building is a perfect chaos of cases and partially-erected exhibits. The materials of this huge structure have been purchased by the Pennsylvania Railway Company, for constructing depôts. The rule which limits the height of enclosures to 15 ft. has been in many instances greatly exceeded, much to the detriment of the appearance of the interior. The Permanent Art Gallery, or Memorial Hall, will be the South Kensington Museum of the States. Large purchases are to be made from the exhibits of the various nations,—such an opportunity will never occur again,—to be arranged there at the close of the Exhibition. The horticultural and machinery halls will also be permanent.

The following important circular relative to the system of awards has been issued from the offices of the United States Centennial Commission: 1st. Awards shall be based upon written reports attested by the signatures of their authors. 2nd. The judges will be selected for their known qualifications and character, and will be experts in departments to which they will be respectively assigned. The foreign members of this body will be appointed by the commission of each country and in conformity with the distribution and allotment to each, which will be hereafter announced. The judges from the United States will be appointed by the Centennial Commission. 3rd. The sum of 600 dollars will be paid to each of the United States judges for personal expenses. 4th. Reports and awards shall be based upon inherent and comparative merit. The elements of merit shall be held to include considerations relating to originality, invention, discovery, utility, quality, skill, workmanship, fitness for the purposes intended, adaptation to public wants, economy, and cost. 5th. Each report will be delivered to the Centennial Commission as soon as completed, for final award and publication. 6th. Awards will be finally decreed by the United States Centennial Commission, in compliance with the Act of Congress, and will consist of a diploma with a uniform bronze medal, and a special report of the judges on the subject of the award. 7th. Each exhibitor will have the right to produce and publish the report awarded to him, but the United States Centennial Commission reserves the right to publish and dispose of all reports in the manner it thinks best for public information, and also to embody and distribute the reports as records of the Exhibition.

Congress has refused permission to the artists whose works have been purchased by the Government for the adornment of the Capitol and other public buildings to exhibit their performances at the Centennial. An American contemporary has the following:—"It is not too much to say that, with less than half a dozen exceptions, the paintings and statuary belonging to the General Government, and paid for out of the public treasury, are utterly beneath contempt." . . . . "We see no way however of making the Government patronage other than detrimental to the true interests of the fine arts in this country, unless the utter worthlessness of the purchases already made is demonstrated in such a manner as to be evident to the meanest capacity." In a country where it is possible for colossal fortunes to be made in a few months by men without any education a true appreciation of art can hardly be expected.

Many earnest and zealous men are striving to effect the same change here as that which took place in the tastes of the English people after the Exhibition of 1851, and to educate and encourage their own designers instead of depending on English and French products for their home manufactures. The majority of visitors to the Exhibition, while admiring the great engineering skill and adaptation shown, are loud in their complaints of the architecture and colouring.

A census of the inhabitants of the city was taken last week. The number reported was 817,000, showing an increase of 143,000 since 1870. From the annual report of the Board of Health, just issued, the number of deaths amounted to 17,805, an increase over the previous year of 2,537.

The water-supply is pumped direct from the River Schuylkill without any filtering. During rainy seasons it is of the consistency of pea-soup. The river is, moreover, considerably polluted above the pumping stations, but the authorities are constructing a large sewer to take the drainage of Manayunk—a manufacturing town six miles above—to a point below the inlet of the waterworks. A household filter, although very requisite, is rarely if ever seen. The city drainage runs into the river. The sewer-inlets are of cast-iron, let vertically into the risers of pavements. Being open, perfect ventilation is insured. Last week night-soil carts were abolished, and the public are dependent on the different odourless removal companies for the emptying of cesspools. The method employed is pneumatic, and has the reputation of working well without any offensive odour. Air-tight vessels on wheels carry off the soil.

The roads, as well as those at New York, are a disgrace to a civilised nation. The Emperor of Brazil is reported to have exclaimed,—"Ah, I see, Centennial; never cleaned or repaired for a century!" Horse-cars run through the principal streets, the rails making a smooth track for carriages. Telegraph-posts disfigure the thoroughfares; but trees are liberally planted along the side-walks.

"The Society of the Sons of St. George, established in Philadelphia for the Advice and Assistance of Englishmen in Distress" will open their new building on St. George's Day. Upon the following day the society will celebrate their 104th anniversary by a banquet. Built of white marble, Classic in style, it is a creditable memorial of the liberality of English residents. Upon its erection and decoration 30,000*l.* have been spent.

The hall, 100 ft. by 50 ft., and 33 ft. high, occupies the upper part of the building. At the north end is the platform. Above this stands the magnificent portrait of the Queen painted by Thomas Sully. To the right and left are niches, one of which will contain a copy of the statue of St. George in South Kensington. The ceiling, supported by pilasters with Ionic capitals,

is painted in fresco. The subjects are Love and Peace (England and America) holding a wreath of olive-branches, with Britannia blessing the union, while Columbia presides over charity and industry. In the vestibule, on the ground-floor, are figures of the Muses. The pediment in front of the building will be capped with a casting of St. George and the Dragon, to be made in England. Mr. J. H. Windrim, architect of the United States Government Building, is the architect; Mr. George Watson, the builder; and Mr. John Gibson, the painter.

The new public buildings, as well as the Post-office, are at a standstill for want of funds.

The building known as the Colosseum has been lately removed from the Broadway, New York, to add to the attractions of the Centennial. It is being erected in Broad-street. Constructed of iron in section, bolted together, and covered with corrugated plate, this was a very easy matter, though attended with considerable expense in removal. The monster representations, "London by Day," "London by Night," and "Paris by Night," will be exhibited. These were purchased and brought from the Royal Colosseum, London.

The new building of the Pennsylvania Academy of Fine Arts will be opened on April 22nd. It cost, exclusive of the ground, 50,000*l*. The Academy was started in 1805. Benjamin West, a native Pennsylvanian, was a honorary member. His pictures, "Death on the Pale Horse," and "Christ Healing the Sick," are among the art treasures.

April 17th.

INSTITUTE OF PAINTERS IN WATER-COLOURS.

As the various annual exhibitions come round, it is not easy to fulfil the duty of characterising them on each re-opening without the appearance of repeating very much the same remarks that had been made in our columns the previous season; but in regard to none is there so great a difficulty in this respect as in speaking of the exhibition in Pall-mall. Each of the regular contributors appears to select a particular effect and repeat it with unvarying precision. In some cases this is really getting past a joke. Is Mr. Bouvier for ever going to paint the same mincing and tripping girl? Will Mr. Chase never let us have one year, for a change, without that eternal "Terrace at Haddon Hall"? Or is he bound under some spell, or engaged on payment of an annuity, to go on painting it for the term of his natural life? Have Mr. Mogford and Mr. Warren laid in an extra stock of yellows between them, which they are under engagement to work off within a certain term of years? And if these things are not so, what is the explanation of this perpetual, almost mechanical, repetition of the same conventional effects?

There are also those who please us by a repetition of excellence, without mannerism, among whom is Mr. Collier, whose drawings, since he became a *habitué*, have been a constant source of pleasure to the critic. "The Valley of the Arun" and "The Weald of Surrey" (43, 149) are equal to any of this artist's previous contributions; the latter is especially fine; and though Mr. Collier has a marked style to which he is faithful, it does not impress us as "vain repetition,"—and why not? Because this artist goes to nature to see what her effect is, instead of sitting down to manufacture an effect of his own and call it nature. In regard to style of manipulation, also, these drawings are models of true water-colour art. Mr. Syer, whose drawings are always marked by true artistic feeling, and often by no little power, sends a large and fine work, under the title "Autumn afternoon in Wales" (75), as well as other smaller drawings, and Mr. Orrock shows the same fine qualities in the depiction of atmospheric effect for which his drawings in previous exhibitions have been noteworthy; that of "Charnwood Forest" (124) is a very fine drawing, which should have taken the place of some one or two of the works which occupy "the line." A better place also was due to so fine and poetic a work as that of Mr. Holloway, depicting "The Joyless Winter Day" (117) with no little force of handling and originality of feeling. The drawings of Mr. Wimperis will, as usual, repay attention; "A Windy Corner" (50) is admirable. Our old acquaintance Mr. Hine is at his best again in his beautiful scenes "in the Downs," so true to nature in their delicate variations of light and colour and detail that we can never quarrel with their author for restricting himself to a class of scenery which he so perfectly interprets. Most of Mr. S. H. Mole's landscapes will repay attention, and Mr. Leitch's "Souvenir of the 'Sandy Coll'" (27) is a fine piece of stormy effect.

If we come to figure pictures, scarcely any can be said to be so thoroughly original and remarkable as the studies, not of human, but of animal figures by Mr. Wolf, who has gained such a strong insight into the characteristic action and manner of different animals. Ordinary animal pictures, compared with his, are like the stuffed skins in a museum compared with the living creatures in the Zoological Gardens. Two pictures of Ptarmigan, in autumn and in winter plumage, illustrate his mastery of minute detail in the plumage and gait of the birds; "A Moonlight Ramble" (25), a solitary bear coming along over a waste of snow, is even better. Of figure subjects proper, Mr. Linton's "His Eminence the Cardinal" (189), in reality a scene from "Richelieu," is disappointing. The artist has never done anything better in execution, seldom anything so uninteresting in subject and treatment. Mr. Cattermole's "James I. examining a Witch" (113), on the other hand, is in his best vein in every way. The spirit and expression of the whole scene are capitally conveyed. Mr. Staniland's scenes are very well intended, but only one, "The Twine-walk, Lowestoft" (76), has originality and character; the others are very artificial and theatrical in sentiment. Mr. Carrick's "Preparing Bait" (57) is one of those pictures which trace their ideal to J. C. Hook; it is an able work, though a little questionable in the colouring of the rocks and seaweed; at least, we have never seen such colours under such circumstances, but will not assert that the artist may not. Mr. Hugh Carter, again, draws his inspiration from Israels; his "Left Alone" (32) is very good. By Herr Israels himself there is one sketchy but fine drawing, "Going Home" (235). The best by far of Mr. Absolon's contributions is the interior of a Brittany cottage (197). Mr. C. Green's "Country Circus" (159) is *ad captandum vulgus*, though well worked out in regard to the audience figures. Over the vulgarity of other works here, such as "Taking the Cream off," let us draw a veil; we should be curious to know what sort of persons buy such things; but there evidently is a demand. Mr. Towneley Green's small drawing, "Her First Offer" (61), has fine qualities of colour and genuine humour and expression. We may mention two very interesting and admirable architectural subjects, that by Mr. Simpson of a "Pillar in one of the Rock-cut Caves at Ellora" (231), and Mr. Wyld's "Street in Algiers in 1833" (51), in which the short columns and large capitals of a rude Romanesque type are puzzling enough, and suggest that the ground-level must have been much raised since they were built. Among things which are out of the regular track is Mr. A. C. Gow's small and carefully studied group of French soldiers of the Napoleon era at Phalsbourg "On the road to the Frontier" (68), a scene which at once recals the novels of Erckmann-Chatrian, by whose pages it was probably suggested.

THE SOCIETY OF FRENCH ARTISTS.

THE twelfth annual exhibition of this Society contains some very fine works. We welcome the presence of a large Corot, an attraction we had scarcely hoped to find again in these rooms at present, the works of the artist having been "withdrawn from circulation" by purchasers. The one exhibited is a very fine forest scene, or rather the skirts of a forest, in an evening light; the title, "Biblis" (92), refers to the prostrate figure seen at the verge of the forest, and lamented after, apparently, by some other personages near the foreground; the figures, as usual, just help the feeling of the scene without being in any way obtrusive. Opposite to this hangs a remarkably fine work by Pierre Billet, "Haymakers Resting" (44), a treatment of a humble theme with almost classic repose and elevation of style. Very fine is the figure of the girl in the centre of the group, with the orange-tinted handkerchief round her head, and equally remarkable for its charm that of the figure lying beside her, with the pleasant face half in shadow and half caught by the sun; the other two figures are equally natural and fine in pose. The landscape may be a little dingy and deficient in air. Billet's single figures, "Girl Washing" (38), and the interior with a "Peasant Girl" sewing (79), are equally good; not mere studies of figures, but painted thoughts, which set the beholder thinking. A feature in this year's exhibition is the number of paintings and studies of ballet-girls and their performances, by Degas, who seems to have made this phase of life his subject. Of the three pictures from rehearsal life in the upstairs room, "Preliminary Steps" (127) is perhaps the best. The artist relies for his effect purely on truthfulness in rendering, with almost pitiless realism, the actual facts and character of the scene and personages, the awkward and careful attention of the girl who goes through a step before the repulsive-looking old instructor, the scraggy forms and lean backs of others who stand nearer the spectator; one seated on a table is evidently trying to get a "twist" out of her back which she has got in some evolution. "The Rehearsal" is almost equally good. It is almost needless to add there is nothing in these pictures of the vulgar glitter and display to which many artists would inevitably be led by such a subject; it is treated entirely from an artist's point of view; there is no attempt even at realism of texture. The small studies in black and white of these and other subjects are arranged on the staircase, and are worth attention. As we have got to the upstairs room we may notice the clever work of Pille, "Reading the Proclamation of the 24th of February, 1793, in Brittany" (128); the stolidity with which the proclamation is received by these out-of-the-way rustics, the somewhat more comprehensive interest in the faces of one or two who are apparently old soldiers, and the supercilious indifference of the young gentleman in the background, form together a very characteristic study. In this room, also, are some of Mr. Whistler's curious dreams in colour, of which "A Nocturne in Blue and Gold" (147) is noteworthy for the actual sparkle of the lights in the craft on the twilight sea. "A Winter Fog" (149), by the same artist, is an admirably studied piece of effect. There is another large Corot, but not nearly equal to the downstairs one.

Returning to the lower room, we may notice a picture in which Millet outdoes Whistler in the latter artist's own way, in the remarkable little picture of a "Starry Night," which is wonderfully successful in realising the effect intended, and strikes one the more by comparison with the "Sawing Wood" (91), by the same painter, an admirable specimen of his other style in depicting, with simple force, the pathos and dignity of sturdy, patient labour. Mr. Legros sends one or two noticeable portraits,—that of "M. Poulet-Malassis, Homme de Lettres," a very expressive though simple and matter-of-fact painting of a sad and thoughtful face; and the full-length likeness of "The Rt. Hon. Lord Emly" (103) in uniform, a picture in which at least the painter has shirked nothing, for scarlet coat, silver lace epaulettes, &c., are depicted in their brightest and most glittering reality, and are only kept in their place by the close and conscientious care bestowed on the modelling of the rather strongly-marked features. The solid merit and unpretentious masculine style of M. Legros's work impresses one more the more one sees of it. Somewhat the same characteristics belong to a study of a peasant girl's head, by Jules Breton (117); and it is instructive to contrast with this kind of work the mere *chic* of such a picture as "An Interruption" (177), by Madrazo (though the face here is far more pleasing than some of his young women,—we can hardly say ladies), or even the highly-finished painting of the very pretty girl, by Jacquet, "The Young Handmaiden" (116), whose fresh, young face is certainly a pleasant enough object, but the whole thing is mere paint without character or style. Manet's "Le Canotiers" (102) is bad in another direction, and a piece of sheer vulgarity, artistically speaking, which we are sorry to meet with in this gallery.

There are two works in the finest style of Theodore Rousseau, of which "Autumn in the Forest of Fontainebleau" (72) is the more striking subject, but we suspect more thought and labour went to the making of the great heavy foliaged tree in the other (No. 62), which the eye seems to penetrate into little by little as we study it. Mdme. Cazin sends one of her best works in "The old Seaport near Boulogne" (155), a desolate shore scene in which we do not know whether to admire most the truthful tone and detail or the sentiment of sadness and loneliness which pervades the whole. Among smaller things Fantin's bouquet of dahlias, &c. (40), and his white roses with their green leaves in a glass (111) are superb in their way; two street scenes by Lépine (39, 46) are admirable; and the little female figure called "Chloe" (22), by Lefevre, a miniature repetition (if we mistake not) of a larger picture that adorned "the Salon" recently, is quite perfect.

AN EXHIBITION OF COSTUMES.

THE Alexandra Palace Company are rather clever in originating new ideas in the way of public attraction and edification in art matters, but not always so successful in carrying them out. Some little time ago they hit upon the notion of an exhibition of glass-work; an excellent idea, which was so mismanaged as to become a complete *fiasco*. During last week they held an exhibition of ladies' costumes, offering prizes for the best designs for dresses of various classes; but here just the same kind of mistake has been made, the judges being persons in the trade, who no doubt acted perfectly fairly according to their lights, but whose ideas, of course, did not travel beyond the requirements of fashion as at present existing. Consequently there was no stimulus towards the suggestion of new and better methods of designing dress, and the awards were evidently given to what fell in best with the acquired tastes of the judges, not for what was really the best designed and most artistic. Had the prizes been awarded by a committee of artists the result would, in some cases, have been quite opposite to what it actually was.

This is a pity, for the idea of a costume exhibition was a very good one; and even as it was, the collection was very pretty, and attracted the interest of a large number of visitors, nearly as large a proportion of gentlemen as ladies. The dresses were divided into classes ("Promenade" costumes, "Reception" costumes, "Dinner" dresses, &c.), and first and second prizes given in each department. Unfortunately, a showy and striking *ensemble* seems to have been more aimed at and better rewarded than really good qualities of design. The first prize for a bridal costume was taken by Messrs. Dickins & Jones, and on the whole justly, for theirs was the most effective dress of the class; but there is, in the existing state of taste, little more scope for really artistic design in a bridal dress than in a bride-cake; the object in both cases is to produce as pretty, showy, glittering effect, and to make the article look as costly as possible. Some of the promenade and dinner dresses were in very good taste; a promenade dress, entitled the "Eva," by the Regent-street firm already mentioned (described as "Silk and wool broché") was exceedingly picturesque, and much superior to the one by the same makers which obtained the first prize in this class. So in the dinner-dress department, the award of the first and second prizes should have been reversed, had we been the judges. The most artistic and effective of the more expensive costumes was a "carriage dress" by Messrs. Green & Edwards, which obtained, and justly in this case, the prize for "the best novelty"; this was a dress with velvet body and very rich damask skirt, the looping of the body in front forming an oblique line from the throat and bosom to the left side of the waist. The whole effect, both of texture, tone, and line, was remarkably good, and such as a painter would really covet in a picture, which could not be said for some others of the premiated specimens. The collection furnished examples of the truth of what we urged a little while since in some remarks *apropos* of Mr. Planché's work on costume, that really good effect is attainable in ladies' dress without extravagant expense in costly and *recherché* material. For instance, the prettiest dress in the room, next to the one just mentioned, was, to our thinking, a yachting costume by Messrs. Redfern, of Cowes, made of "washing linen," and certainly not expensive; it is not our business to advertise prices, suffice it to say that this was a more artistic-looking dress than many that were to be seen at four or five times the cost. Of course, a special character is aimed at in a yachting costume, and a too ornamental or showy appearance would be out of place; but it is worth remark that this very condition leads to a much more artistic treatment of material, a much more definite and carefully-arranged design in the line and fall of the costume, than we generally find in connexion with the more expensive and showy system of bows and other additions, of the kind which we should include under the general term "fuz-buz," which ladies seem to think a necessary element of a handsome costume. The same firm, who devote themselves to yachting costume, took, however, the first prize from all comers for the best dress "for a young lady of ten years," by what they termed the "fish-wife" costume, which, though too "pronounced" for really good taste, was certainly the most effective thing of this class. Indeed, considering that the competition was, as we understood, very keen for this prize, and for that for a dress for a child of five, we were really surprised at the common-place nature of most of these specimens of young people's dresses.

We should very well like to see such a competition as this repeated in due time, but with the award of the prizes left to a committee of artists, pictorial and decorative. The result would in all probability open the eyes both of costumiers and their fair customers a good deal in regard to the constituents of really good taste in dress.

MORE MOTTOES FROM OLD HOUSES.

IN Cumberland—the land of the Dacres and Howards—there are a few more mottoes of the kind noticed in a former number of this journal as having been placed by our forefathers over their house-doors, windows, and mantelpieces. One of these is to be seen in the front of the grand old pele-tower now incorporated in the Elizabethan mansion known as Clibburn Hall. This tower was the fortified seat of the Cliburne family from the reign of Edward III. In 1567, Richard Cliburne enlarged his dwelling by adding two long wings to it, so as to make it as convenient as the new Elizabethan mansions his friends were building on all sides of him, and over one of his new doorways his mason placed a large square slab, bearing his shield, his initials, R. C., and this inscription:—"Rychard Clebûn thus they me cawl, wch in my tyme hath bealded ys hall. The yeare of oure lord God, who lyst for to neum 1567. R. D., mayson." By-and-by some further alterations were made which covered in this new doorway, when the stone thus inscribed was taken out of its first place and inserted in the western face of the old tower, whence it still looks down upon the Elizabethan courtyard and out upon the Cumberland skies. We have reason to know that Richard Cliburne did not compose this inscription; he only copied or adapted a neighbour's superior originality. This neighbour was Christopher Crackenthorpe, who, besides his estate in Cumberland, was possessed of property in Westmoreland, on which he had built himself a mansion-house in the fashion of the day, called Newbiggen Hall. Over a doorway in Newbiggen Hall we may still see the lines Richard Cliburne had in his mind whilst his mason, R. D., was sitting at his new work. They run thus:—

> "Christopher Crackenthorpe thus ye me calle
> Whye in my tyme dyde bylde this halle,
> The yer of oure lorde who lyst to se
> A.M. fyve hundred thyrty and three."

Still on this land of sheep-pastures, green and grey fells, huge boulders, huge standing stones, and countless cairns, we come to another example. It is in Penrith. A century after R. D. looked upon his work admiringly, a William Robinson appears to have acquired a competence in London, and then, with his heart full of memories of the placid lakes and stony hills of his native county, returned to Penrith to enjoy it. He gave a rent of 10*l.* yearly to the grammar school, and 20*l.* yearly towards a girls' school, the town records tell us; and he caused to be carved on the front of his house this short and condensed legend:—"*Ex sumptibus Dn. Wil. Robinson civis Lond. Anno* 1670." Near Cockermouth, too, stands an old mansion that was built by the Swinburnes in 1581. It is now used as a farmhouse. Over the door is the following inscription:—

> "John Swynburn, esquire: and Elizabeth, his wyfe:
> Did make cost of this work in the daies of ther lyfe.
> Ano. Dom. 1581. Ano. Reg. 23."

There is yet another old mansion that has come down from the pleasant pomp and circumstance of being the residence of a family of Cumberland gentry to the usages of a farmhouse. Dalston Hall sees no more coming and going of hunting and hawking parties, no merry wives on its terraces, no sweet Anne Pages in its sunny portals, but there is a word for us from those old times carved above an upper window that recalls them vividly. This inscription is in old English characters, and simply records that "*John Dalston, Elsabet wiphe, mad ys byldyng.*" Again, at Eamont Bridge, on the Westmoreland side of the bridge, on the lintel of a small house is sculptured "*Omne solum forti patria est.*"

We have met with an example, too, in Ireland. The house that was thus embellished was the residence of one of the leading merchants in the town of Galway, named Lynch. He belonged to a family whose name occurs as many as ninety-four times either as mayor, or provost, or portreve of Galway between the years 1274 and 1654; and which is still more remarkable for the spartan virtue of one of its members. This was James Lynch, mayor, or warden of Galway in 1493. He traded largely with Spain for wine, and on one occasion sent his only son to that country to purchase a cargo. Unhappily, this young man failed in his trust and spent his father's money upon his own pleasures. He procured the wine, however, from a Spanish grower upon credit, with the understanding that his nephew should accompany the cargo and bring back the price of it. When the good ship neared the Irish coast young Lynch began to fear his father's anger, and believing that the crew would keep silent, he threw the young stranger overboard, and thus arrived with the cargo and without any drawback to it. He was welcomed home with the keenest of receptions, and soon settled down as prosperously as the rest of his family. But, just as he was about to marry the beautiful daughter of a merchant as wealthy as the Lynches themselves, one of the seamen found himself dying suddenly, and, in a fit of terrified remorse, sent for the mayor and told him of the guilt of his son. Young Lynch was tried and found guilty, and upon his father devolved the fearfully painful duty of pronouncing sentence of death upon him. When the day for his execution arrived a great turbulent crowd gathered before Lynch's house and endeavoured to rescue him; but his unhappy father, after urging the people to allow the law to take effect peaceably, without effect, closed his door, and, with his prisoner safe, ascended a winding stair that led to a window that looked out upon the street and down upon the excited crowd below. With his own hands, he fixed the rope that was round his son's neck to a staple projecting from the wall, and then, after a long and fond embrace, pushed him from his hold. His friends below looked up and saw his dying agonies with awe, and then thinking of the father's magnanimity, grief, and loss, slowly and quietly dispersed, appalled. The old merchant shut himself up in his house and remained mourning all the rest of his days. His sorrow was commemorated in an inscription placed over his doorway on a stone carved with a skull and cross-bones:—*Remember Deathe. Vaniti of vaniti and al is but vaniti.* In these days of improvements his house, with the winding stair and the window that was such a terrible centre in this peculiar phase of Lynch law, have been pulled down. A church, dedicated to St. Nicholas, stands near the site, and into the north wall of the churchyard have been set two of the doorways and several of the windows of the old place. In this same wall, within 10 ft. of the site of the tragedy, is placed, for preservation, the stone carved and inscribed as above mentioned.

In Wales, the practice appears to have been almost as common as in England, although, for the same reasons, examples are equally scarce in both countries. The Wynnes of Wynnestay had a distich allusive of the name of the house carved upon one of their towers,—Wynne stay, or rest satisfied with the good things Providence has so liberally showered upon you,—

> "Cui domus est victusque decens, cui patria dulcis,
> Sunt satis hæc vitæ, cætera cura labor."

Those who wend their way among the vales and ravines, the streams, the crags, and hills of this country, all thickly studded with memorials of pre-historic antiquity, will frequently come upon substantial-looking square stone houses, now occupied by farmers, but originally the residences of the gentry of the country. In one, the careful eye will note an inscription on the lintel; in another over the mantelpiece; in a third, perhaps, on a beam in the ceiling of the principal chamber. Sometimes the inscriptions are in Welsh, as in the instance over the fireplace in the hall at Newton, Brecon; but more frequently they are in Latin. Sometimes, only initials and dates are given; and they are not always intelligible, partly because of their abbreviations, and partly on account of their worn condition. There is one of these old substantial houses of decayed fortunes at Penmorfa, now used as an inn, called Bwlch y Pedwan. It is a grey old place, sunny and serene-looking, dwarfed by the grey hills that tower beside it. On the centre beam of the largest chamber on the ground-floor are carved the following letters and date:—S^{r} I^{o} I. 1664. A Sir John Owen lies buried in the church close by, and these letters are supposed to represent him, by the presen

tenant of the homely quarters, though in an unsatisfactory and indistinct kind of way.

We may add, though Shakspeare does not add to our store of incriptions, he appears to glance at the fashion he saw spreading around him of increasing house accommodation in the following passages:—

"When we mean to build
We first survey the plot, then draw the model;
And when we see the figure of the house,
Then must we rate the cost of the erection:
Which, if we find outweighs ability,
What do we then but draw anew the model
In fewer offices; or, at least, desist
To build at all?
* * * * *
We survey
The plot of situation, and the model;
Consent upon a sure foundation;
Question surveyors; know our own estate,
How able such a work to undergo.
* * * * *
Like one, that draws the model of a house
Beyond his power to build it; who, half through,
Gives o'er, and leaves his part created cost
A naked subject to the weeping clouds,
And waste for churlish winter's tyranny."

INDIA, AND OUR INTEREST IN IT.

NEVER, perhaps, was the "East,"—to use that very general term,—of greater interest to the "West" than it now is, and it would be not a little difficult to say whereabouts that interest chiefly centres itself. There is the very *land* of the East first of all, then there are the specialised people who have dwelt and who yet dwell in it; and then, again, there is the *history* of it, going back so far as to be beyond record. And then there is the immediate *present* of it, by no means the least remarkable of the phases which it has seen. How much does the West, we may usefully just now ask, owe to the East, and can the debt be repaid, and how? It is to be feared that but very little indeed has as yet been thought of all this. How different, we often think, would the state of this England be if but the East, and the Eastern man, and his mode of thought and work in this world never had existence, or had he never been heard of beyond his own borders! It would be, indeed, a difficult thing to sum up with any approach to accuracy what and how much we do owe to Eastern thought and inventiveness, and, may we not add, mysticism.

The East, as we have said, is so wide a term that but a little of it at a time can be glanced at. Volumes have been written about Egypt, and the Holy Land, and the home of the Arab, and other places essentially Eastern, and yet the subject matter of them is not exhausted,—hardly, indeed, commenced, if we look a little below the outward show of it. A single Eastern country, or rather congeries of countries, a single empire, will furnish matter for a few thoughts on this fertile theme,—our possession, India.

It is often enough said how curious an anomaly it is that the history of so great an empire as that of India, the possession of which we view with so much pride, and guard so jealously, is generally regarded with so little of living and abiding interest. Yet, how very great it is as compared with so many things, small enough sometimes, which do excite an interest all absorbing at least for the moment. This surely should not be, for India is one of the most wonderful spots on the earth's surface, in well-nigh all ways,—the country itself, and its natural features, its inhabitants, and their individuality, and their history, and, not least, the peculiar fine art of these strange people, as formed and modified by their equally specialised religion, to say nothing of the hoar antiquity of it all, stretching, as it does, far, far beyond the dates of recorded history. We must confine ourselves to matters artistic.

But a word first as to the country itself, and the materials it furnishes for art, found everywhere to be influenced in no small degree by the materials nature provides on the spot in which it grows up. We might add climate, too, here, as a modifying influence in art production. Change the climate and the natural materials of a country, the people of it remaining the same, how unlike and how different must the resultant art, and building, and consequent architecture of such a country be. Even "style," which comes from the mental organisation of a race, must needs change,—a curious, though somewhat remote, subject of inquiry.

India may be said to be the world in miniature, for there are in it vast plains stretching for many hundreds of miles without interruption or pause. And there are mountains the highest in the world, and by the side of which the famous European Alps get to be thought small. The long and interminable range of the Himalayas, the abode of snow, and which divide India from Northern Asia, are indeed notable every way. Out of them, and springing from their huge glaciers, rise the great rivers which would always seem to have exercised so strange a spell on the native mind, and to have been regarded with such religious awe and veneration, and to have consequently influenced in no small degree the temple building. The rivers of the Hindoo were not, it is certain, made for nought, nor was ever opportunity missed of turning them to artistic account. Looking, therefore, to the great natural features of this vast country, may it not well be asked which of the primitive forces works in the strongest way in the moulding of the rough materials into form,—the minds of the rude and primitive people, or the nature amidst which such people live as moulding their very minds to act upon it? In such a country, and surrounded by aspects and forces of nature so vast and so powerful, it is impossible that it could be otherwise than that the minds of the men who dwell in it should be wonderfully influenced by it.

But in this place, as a matter of course, it is in an art and architectural view that India becomes of so paramount an interest, for in it may be seen yet going on a really primeval condition of things. Up to this present it has barely been noticed, if indeed at all. It is in the "outlandish" districts, and away from the ordinary routes, that such is to be found, although it is not wholly absent elsewhere. Given the materials, and that instinctive idea of putting them together, and the hard necessities of the case,—then the very rudest, and as we are apt to term them, the most ignorant of people, are found to provide themselves with house shelter, and other constructional needs, in a way not a little ingenious, and to the purpose, and at times singularly artistic and picturesque. We have had opportunity of seeing some photographs lately of this Hindoo work, exhibiting some skill of this kind while in actual process of construction. It is a little calculated to upset our notions of architectural invention and designing, for they are built up evidently without reference to architectural style, as that term is commonly understood, yet do they more or less evidence style, *i.e.* the style of architecture peculiar to the race of men who design and build them. We may cite an instance or two in proof of this from house or common hut building, and from rude bridge-building, the latter as much of a necessity here as the hut building itself. Both evidence how little there is that is new under the sun, for things here and all round us which look so new and of to-day have their precedent in distant India of thousands of years back.

Bridge-building in the "hill districts" is a necessity, for the water-courses and streams are so many and so steep and so rapid that by no other means can they be crossed, and it might well puzzle, to look at them, an acute engineer how to accomplish the work in the cheapest and most direct way. On a heap of *débris* on either side of the torrent, a stout and broad plank, or planks, are placed at a slight incline; on these, other planks are fixed, so as to overlap those beneath them. On these, again, are others, until a sufficient number are laid so as to meet each other from the opposite banks. In this simple way a bridge is built over a mountain torrent by rude men, who know nothing of our learned ways of doing such things, and certainly without a thought of "designing" anything architectural or picturesque, or in a national style of art; and yet are these effective structures, rude as they are, singularly picturesque, and have a certain "Hindoo" architectural look about them, growing, as it were, almost out of the earth they rest on. Some of these are without handrail of any kind, and present simply a narrow plank, over which you must needs pass across the raging torrent beneath. Nothing can be simpler than these bridges, or more purely constructional, or more devoid of what we should term art; and yet, as we have said, they seem to belong to the country, and have a special Hindoo look about them. They might have been invented in the mound-building age of the world, and were so, perhaps. They are worth a little study, though so rude and primitive.

Then there is *house* and hut building, "designing" perhaps we can hardly call it, for it would seem to be managed through a sort of instinct, so absolutely necessary for its purpose is everything in it. There are, as may be supposed throughout so vast an extent of country, a number of house-building ideas characteristic of each locality more or less. Nothing in the way of house-building can be simpler. Mere earth, or "mud," composes the low walls of such a dwelling; and this sometimes mixed with small stones, or fragments of granite, is found to resist the rains for many years, and is easily renewed. The flat roof, too, as simple as the walls, is "terraced" with this mud, and is found to turn the rain well. Art, too, at times comes in here,—art-writing, in a strange way, and truly autographic; for the builder and owner of the hut himself, puts his mark, if not his name, on the walls of it. Stripes of colour, like the houses of Italy in the antique times, ornament them, and odd-looking ornaments every here and there are to be found. These houses have neither chimneys nor windows, all the light entering in at the ever-open door. All Hindoo houses are not like this; we give the simplest possible and the most commonly to be met with. Millions of human beings under the burning sun live in such huts, sleeping on the bare earth: the primæval man yet lives, it is quite certain. We might go on to almost any length, and tell of other kinds of house building, stranger even than these. It might be useful to compare in detail an Indian "hut" with some of our London dwellings in out-of-the-way places.

We have thus glanced for a brief moment at Indian art and architecture in anticipation of what is, as we are assured, to be exhibited to the public on the return from India of the Prince of Wales. Many things of surpassing interest he will surely have acquired, attractive to everybody; but many things there will be, doubtless, of a less striking kind, but may be more instructive to those who look a little deeper. We trust everything will be "on view" for a time, even small photographs and native drawings. His Royal Highness has seen very much that is strange and new, not only to himself, but to all, and has had opportunities far beyond what has been hitherto possible. We here plead for the smaller and less striking objects. It is wonderful how much insight into the ways of a strange country is to be got from the sight of what might be thought commonplace and insignificant,—more so at times than from the large and more imposing. Many things we could here name which would go far to prove this. It is for the most part only incidentally and by accident that we meet with accounts of the inner life of a strange people in common books of travel, and thus get to see a something. But more than this is needed sometimes; and to get to the secret of the matter, we need to see into the lower life of a distant and strange country, and into its more familiar and common things. We know as it is but very little indeed of this, but it is worth the knowing. Millions of men and women live, and work, and think in their own way at the feet of those huge mountains and endless rivers of whom we know simply nothing! But we *may owe them* a something.

THE ART REVIVAL OF THE ELEVENTH CENTURY.*

IN the eleventh century the great revival began, and what is called Christian art dates from that period; but this revival began in the West, and not in the East, and from that time Rome has always been half a century behind the rest of Europe. The Mediæval architecture of Rome would not bear comparison for a moment with the magnificent cathedrals of the West of Europe, in England and France, and Germany, and Belgium and Holland, and others further north. "Necessity is the mother of invention," and in Rome the builders had such an abundance of materials ready for use, that they had only to adapt them to their wants, and had no need for invention. Marble columns were as common in Rome as oak posts in England, and it is no wonder that they contrived to use these beautiful columns, and make their buildings to suit them. But to return to the earlier period.

It is very interesting to trace the gradual progress of the fine arts in Rome, and to see how far the Romans themselves had advanced before the conquest of Greece, which changed all their ideas. It is evident that they had introduced the arch, which they have used both in the Tabularium and in the Emporium, the only two buildings of any importance of the early part of the time of the Roman Republic that remain to

* From a lecture by Mr. J. H. Parker, C.B., on the "Connexion between Archæology and the Fine Arts," delivered at the British Academy of Arts, Rome.

us. With the arch they used concrete walls, and began to place on the surface of the wall the elegant ornament called *reticulated work*, to give it a flat, smooth surface. In the Emporium we have the beginning of this; the work there was called by Vitruvius *opus incertum*, or irregular work: it had not then reached the regular form of the network called the *opus reticulatum*, which began in the time of Sylla, and goes on to the end of the first century, and a litile beyond it to the time of Hadrian. Sculpture and painting are not my subjects; architecture alone has occupied all the time I have been able to give to the study, but I cannot close my eyes, and it is easy to see the very rude character of the early sculpture of the Romans, such as the bas-relief of Curtius leaping into the gulf, found on the edge of that gulf in the Forum Romanum. This piece of sculpture, supposed to be about two centuries before the Christian era, is, I believe, the earliest piece of Roman sculpture that we have remaining; but of the earlier period of Etruscan sculpture we have abundance, and often very good, and these must be long before the Christian era. The gigantic lions' heads on the bank of the Tiber, in the upper part of the port of Rome, must be of about 180 B.C., and are very much of the Etruscan character, just before the period of the introduction of Greek art. The paintings in the Etruscan tombs, and still more on their vases, are also very remarkable, and often very fine; they are sometimes rude, and partaking of the Egyptian character, as at Veii. In other instances the drawings are very fine and good; the series now being exhibited by Prince Torlonia in the new museum in the Collegio Romano are good instances, and are said to be three centuries before the Christian era.

The remarkably fine collection of objects of ancient art found near Naples by Castellani could have had nothing to do with Etruria; this and other similar discoveries have induced the archæologists to abandon the name of Etruscan for ancient art, which was not confined to Etruria, but extended all over Italy, and especially in the southern part called Magna Grecia. The name of Italo-Greek is now given to these objects. It must be remembered that after the inhabitants of Veii were transferred to Rome the Romans must have been half Etruscan. Some of the objects belong to an earlier period than the time of the Grecian Republics, and there is a mixture of the Egyptian character in them. The massive character of Egyptian architecture, and their rude and stiff drawing, is well known. The fine collection in the Egyptian museums in the Vatican and in the Capitol enable those who are interested in the subject to study it. Of Assyrian art we have fine examples in the British Museum. Of the art of the Persian Empire we know little, but these great empires of the early part of the world's history are too remote to be of much general interest. The history of modern art begins in Rome; the earliest Christian art was an imitation of the Roman from the remains they had left in all the provinces of the old Roman Empire, which are the kingdoms of the middle ages and of modern times. The remains left by the Romans often show that they had possession of large districts of which we have no other record. Archæology is better evidence than written history, in the early period, before the use of writing. The influence of Roman art was not confined to Europe and the Western Empire, it spread over the Eastern Empire also. After the seat of empire was transferred to Byzantium, because that was a more central position than Rome, they retained their hold for many centuries over a great part of the Eastern Empire, and in the West they retained the command of the Mediterranean by their police galleys down to the eleventh century. But Roman art declined very rapidly after the third century; the convenient but bad habit of using old materials ruined their art.

At the beginning of the eleventh century, when Christian art began, there were no masons, and the art of cutting stone was lost; it was reproduced by copying the remains the Romans had left, and sometimes by getting artists from Rome, more frequently by getting drawings made by the bishops who went to Rome for their palls (or the priests who accompanied them, for the clergy were the only educated people at that time), and imitating them as well as they could. But as "Necessity is the mother of invention," the difficulties in the way of energetic people only stimulated them to greater exertion, and our magnificent Mediæval cathedral-churches and castles and houses are the result of this necessity. The Romans and the Italians (not having felt this necessity) followed the new style reluctantly and slowly; for this reason the buildings in Italy of the Middle Ages are always half a century behind the style of corresponding buildings in the West.

There had been a great temporary revival in Rome and Italy in the time of Charles the Great, but it did not last. An immense number of churches were built or rebuilt at that time, but after the ninth century there are none at all for at least a century, though perhaps not always exactly at the same time in all other countries. Arches and vaulting are the great peculiarity of Roman architecture; if that had been *continuous* (as some great scholars think, and as written history *by itself* would make it appear), the art of building vaults would not have been lost; yet it is certain that the builders of the west of Europe, in the North of France, and in England, did not venture to build a vault over a space of 20 ft. wide before the middle of the twelfth century, nor do we know of any vaults of such dimensions in Italy during the tenth or eleventh century; the strictly classical portico of the church of St. Giorgio in Velabro, with an inscription upon it recording its erection in the middle of the thirteenth century, at the same time as Salisbury Cathedral, Westminster Abbey, and a host of the magnificent buildings in England and France, seems at first sight quite incredible to the English or French archæologists. As the other arts always followed architecture very rapidly, the sculpture of the end of the twelfth and of the thirteenth centuries in England and France is superior to any in Italy of the same period. This was the opinion of Mr. Cockerell (who resided long in Italy, and was an enthusiastic admirer of Italian art), as he states in his work on the sculpture on the west front of Wells Cathedral, which is of the early part of the thirteenth century, that there was nothing in Italy at that period to compare with this. Roman art lingered longer in Aquitaine than in any other part of Europe, and the first sculptors in the north of France came from Aquitaine at the end of the eleventh century. This happens to be just at the time that the ports in the Mediterranean there had thrown off the Roman dominion.

One of the earliest examples of architectural sculpture of the transition from the Romanesque, or debased Roman, to the magnificent Gothic style of the thirteenth century, is at Carcassonne, in Aquitaine, almost on the shore of the Mediterranean, and it represents a palm-leaf, a proof that the sculptor had come from the East, probably from Byzantium. In Perigueux and Perigord there are many churches of the eleventh and twelfth centuries of the character called Byzantine, of which the distinguished feature is the cupola, or what we commonly call the dome in England, from the Italian name of a cathedral church, *Duomo*. But for many centuries of the Middle Ages there was no communication between Aquitaine, in the south of France, and Normandy and other parts of the north. It was not until the time of Henry II., or the later half of the twelfth century, that the communication, of persons and ideas, began, by that king holding his court at Angiers, and calling on the nobles and bishops of the south and of the north, including England, to meet there; all the educated classes of his great dominions there became personally acquainted, and freely communicated their ideas to each other. At that time the dominions of the English Crown included all the western part of France, from the Channel to the Mediterranean, not by right of conquest, but by hereditary succession from his father and mother. Several varieties of the Romanesque style had been developed in different provinces of that wide extent of territory, each derived from some one Roman building, and developing the peculiarities of it, as has been shown by M. De Caumont in his valuable works. Thus the architecture of each province is traced back to Rome as the centre. With the architecture comes necessarily the sculpture and the painting. All parts of the old Roman Empire must go back to Rome for the origin of their fine arts; even Greece and the East had become Romanised, and though the fine arts began there earlier, they must still be traced through Rome.

Conversazione.—Mr. George Robert Stephenson, the president of the Institution of Civil Engineers, will give a *conversazione*, on Thursday, the 1st of June, in the Galleries containing the "Loan Collection of Scientific Apparatus" at South Kensington.

CLEARING THE ATMOSPHERE.

On the motion of the Duke of Northumberland, an address has been presented by the House of Lords to the Queen, praying for the appointment of a Royal Commission "to inquire into the working and management of works and manufactories from which sulphurous acid, sulphuretted hydrogen, and ammoniacal or other vapours and gases are given off, to ascertain the effect produced thereby on animal and vegetable life, and report on the means to be adopted for the prevention of injury thereto arising from the exhalations of such acids, vapours, and gases."

As in the pollution of rivers, so in the defilement of the atmosphere, the destructive powers of man have exceeded his conservative tendencies; and while increasing trade and extended manufactures have added manifold to the waste products which, thrown in small quantities into the stream or upon the air, would be almost inappreciable, hardly any precautions have been adopted to prevent the evils arising from an excessive use, or abuse, of air and water as common sewers and scavengers.

Not that science has not provided ready means of utilising, or at any rate neutralising, the many new "waste products" which our many new industries are creating; but as the miner or manufacturer has been brought up to the belief that the readiest means of ridding himself of his "matter out of place" is to throw it in a heap in the nearest vacant spot, he is unwilling to bother himself about any new method of turning it to account which will necessitate his storing it or altering his accustomed plans. He says, probably, that he has quite enough to attend to in his legitimate business, without adding to his undertaking by creating a new trade; and although it may be absolutely proved to him that his refuse may be turned to profitable account, he declines to take the trouble, preferring to pour it forth into the nearest stream or into the atmosphere, forgetting or ignoring that he is thereby injuring others by his neglect.

Manufacturers now claim, in many cases, a prescriptive right to pollute streams, and these vested interests stand in the way of those who would endeavour to force them by legislation to divert their waste matters from the rivers. But a prescriptive right to pollute the atmosphere, which cannot by any legal enactments be declared to be, in any locality, or in the most limited sense, subject to proprietary rights, cannot be recognised. The right of every individual to the free access of air has often been asserted in legal judgments, as recorded in these columns, and the enjoyment of pure air by all persons and classes is a principle recognised at common law. But the principles of common law are, unfortunately, very difficult of enforcement. "The common law of the country affirms the right of every owner of land to make use of the water of the river or stream passing through his property, but it prohibits the employment of the water in such a manner as will render it unfit for the use of those lower down the stream. This common law right," however, says Major-General Sir William Denison, in his Report on the Pollution of Rivers, "exists now but in name; the cost of enforcing it by legal process is so excessive as, practically, to leave complainants without redress."

And if this is so in the case of polluted water, much more so is it in the instance of polluted air. It would be a most difficult thing to prove that a particular chimney was the cause of injury inflicted at a distance of many hundred yards, especially where other chimneys exist, which are, *primâ facie*, equally guilty, and the impossibility of any individual attacking the Cyclops of a whole manufacturing town in the courts of law is self-evident. And it must be remembered that every chimney, even of our private residences, contributes its quota to the defilement of the air, and in large cities the aggregation of these small contributions is sufficient to create a considerable and appreciable effect, though each, singly, may be practically harmless; and under such circumstances it would be difficult to draw a line between the injury to the air effected by the combination of the minor nuisances, and that caused by a larger and more dangerous factory chimney.

Smoke Nuisance Acts have been passed giving power to individuals, by a more easy process than is otherwise afforded, to compel the owners of chimneys of a disagreeable tendency to prevent nuisances therefrom. These special enactments do not afford relief against those persons whose occupations injure the air in such

a way, by other means than by actual smoke, as to do injury to the complainant's health, or property, or comfort; and even if they did, such remedies are costly; and while the rich can avoid the evil and expense both, by removing into the open "country" to live—submitting to breathe a polluted atmosphere for a few hours a week, while they have the alternative of keeping out of it as much as possible—the poor are forced to live, night and day, amid the exhalations of factories and works whose breath is the blast of death and not the breath of life, since they cannot afford to pay the price of war against the evil, and are equally unable to run away from it.

In the interests of the poor, then, it is necessary that measures should be adopted to enforce the purification of the air. In passing the Alkali Acts, the Legislature recognised the necessity, and compelled the owners of chemical works to condense their gases and convert them into solids. This they have done, in some instances to their profit, in others to the injury of the public in another way, by turning the matters thus condensed into the streams instead of into the air.

But legislation has not kept pace with commercial industry, and the good work inaugurated by the late Earl of Derby has not been extended, while the production of noxious gases has gone on increasing in others besides alkali works. In fact, nearly all our large manufacturing centres are rapidly becoming uninhabitable. First the immediate neighbourhood and then the suburbs have been attacked, and the area conquered by the foul gases has gone on extending till whole tracts of country are deprived of vegetable life, and of the means of supporting animal life. The districts of which Newcastle, Birmingham, Wolverhampton, and Burslem are the centres, and many others, are at the mercy of a more or less perfectly invisible enemy which overhangs them, and smothers them with its life-destroying properties. Man and a few domesticated animals are the only beings capable of withstanding the effects. Sheep and cattle and birds cannot exist. And man does not remain unscathed. We have already alluded to the proved deterioration of the human race in certain of our manufacturing districts, and that this decadence is owing to the want of pure air there can be little doubt. What child can be expected to develop into a well-grown man, who is nursed in an atmosphere not of oxygen, but of sulphuretted hydrogen? What beings can be expected to remain in healthy action for three score years and ten who are designed to breathe the pure air of heaven, but made to inhale volumes of ammoniacal vapour? It is time the powers of injury possessed by the tall chimneys which overshadow all our large towns were curtailed. Education is being brought within the reach of all, but it is useless to expect the *mens sana* if we ignore the requirements for the existence of the *corpus sanum*.

AMERICAN ARCHITECTS AND THE STATE.

THE New York Chapter of the American Institute of Architects has presented a memorial to the Legislature of New York, protesting energetically against the adoption of certain designs of the Advisory Board for the completion of the Albany Capitol. The memorial urges that the design, as amended by the Board, is "an agglomeration of incongruous forms," Renaissance and Romanesque, inharmonious in detail, and that, if it is carried out, these faults will be as obvious to the public as they are now to architects. It speaks of the towers and dome as being discordant in character, the colour decoration as destructive of repose and dignity, and the new work in general as extravagantly rich and expensive in parts, and meagre to baldness in others.

The memorial thus concludes,—"The New York Chapter of the American Institute of Architects, in the general interest of the public and of its art-education, as well as of the profession which it represents, feels itself called upon to urge you to sanction no design for the completion of the Capitol building which is not harmonious, in character and style, with the work already executed; or if the work is so faulty in construction, or so bad in design, that it is, in your opinion, impossible to complete the structure in harmony with it, so as to make a good and suitable Capitol building, this Chapter submits that the common interests of the public and of the art of architecture demand that the façades should be removed and sold, and that the work should be commenced anew."

FINSBURY PRINTING AND STATIONERY WORKS.

THE gradual increase of the business long carried on by Messrs. Waterlow & Sons having rendered more convenient premises than those hitherto occupied a matter of necessity, the firm a few years ago acquired the freehold of the ground formerly occupied by some fifty houses and shops known as Finsbury Market. This ground, measuring 166 ft. from east to west, and 152 ft. from north to south, is bounded on its several sides by North-street, South-street, East-street, and Clifton-street, thus furnishing a space well suited to the purpose for which it was required. Upon this site a large factory has been erected, comprising a well-lighted basement, with five stories above.

From the accompanying plans it will be seen that the four frontages are occupied by continuous buildings, 50 ft. in depth, leaving a central courtyard, a quadrangle, 65 ft. by 52 ft. This is covered over above the level of the main roofs by a structure of iron and glass, so constructed as to afford complete protection from the weather, and at the same time to secure light and ventilation; the general effect of this arrangement being to obtain for every room in the establishment an unusual degree of lightness. Ornamentation has not been greatly studied in the erection, but care has been taken to ensure the comfort of those employed by the firm; and seeing that the building furnishes working room for some 2,000 persons, this consideration is of no slight moment.

The courtyard is provided with two entrances, one in East-street, and the other—which is the principal one — in Clifton-street, where the general offices are situated. From this courtyard access is obtained to six large rooms, the total area of which is over 19,000 square feet. On the basement six similar rooms extend over the entire site; and here will be found the store-rooms, lavatories, &c. (the sanitary arrangements throughout being most complete and excellent); while still lower, beneath the central portion of the basement, is a tank, constructed to hold 30,000 gallons of water, other tanks being placed on the staircases, and two more, very large and of cast iron, on the roof. Two fireproof and enclosed staircases, situated near the centre of the two ends of the quadrangle, and opening out on to fireproof balconies, provide access to the several rooms on each of the upper floors. At the rear of each staircase a brick shaft extends from the basement to the top of the building, up which all main pipes for gas, water, and steam are carried, as also the cast-iron soil-pipes for the several w.c.'s, lavatories, and so on, which are arranged on each balcony and on the roofs. Behind the eastern staircase the main furnace-shaft is erected, and stands independent of the walls of the building. This is 105 feet high above the basement floor-line. At each angle of the balconies powerful lifts are placed, one at each corner—three of them being worked by steam and one by hand power.

The six floors (including the basement) comprised in the building give a total available area of about 130,000 square feet; but by an admirable arrangement of party walls immediate communication from one room to another is avoided, the access in all cases being by means of the balconies; consequently, each section is divided into six separate and independent fireproof buildings, while each floor is also fitted with firecock and hose at convenient points. The general impression derived from an inspection of the premises as a whole is that everything has been planned and contrived to afford the utmost facility for carrying on the various processes connected with the business.

Taking the several portions of the establishment in detail, we note in the basement the store-rooms for paper, lithographic stones, the wetting and drying rooms, rooms devoted to powerful hydraulic presses and cutting machines, a smith's shop, the boiler-rooms, and large steam-printing machines, other fine specimens of which are also to be met with in two large rooms on the ground floor, there being seventy or eighty machines of this class. The smith's shop is of itself a matter for surprise, being equal in capacity to many engineering establishments, although simply occupied with the manufacture and repairs of the machinery on the premises.

Leaving the basement for the ground floor, we note, in addition to the machine-rooms already mentioned, the shipping, country, and general offices, which abut on the western or principal entrance in Clifton-street.

On the first floor is located the binding department, the several rooms being occupied by folders, stitchers, vellum-workers, gold-finishers, edge marblers, and the like; steam and other machinery and powerful hydraulic presses, all duly fitted with the latest improvements, being employed to supplement the hand labour.

Four large rooms on the second floor furnish the necessary space for the lithographic department, a staff of artists and draughtsmen being constantly employed in preparing designs; while the lithographic printing branch turns out the varied kinds of work, from the cheapest to the most elaborate, every needful appliance being duly provided. A specialty of this department is the peculiar process known as vegetable printing, which is chiefly applied to the production of bankers' cheques, its main excellence consisting in the absolute impossibility for any alteration to be made in the printed matter without detection ensuing. Some idea of the extent of this department may be formed from the fact that in one room alone are no fewer than seventeen of the largest steam-machines. On this floor are also carried on the varied processes appertaining to machine-ruling, type-paging, and other minor kinds of letterpress printing. In this department several patents belonging to the firm are brought into requisition.

On the third floor the manufacture of envelopes goes on at a surprising rate; the different branches including envelope-cutting, the preparation of the adhesive matter, gumming, folding, embossing plain and in colours, in cameo and relief, and black bordering, in most or all of which hand labour is largely supplemented by costly and intricate machinery. This department is supplemented by the die-sinking branch, in which official seals, coats of arms, crests, and other special designs are produced.

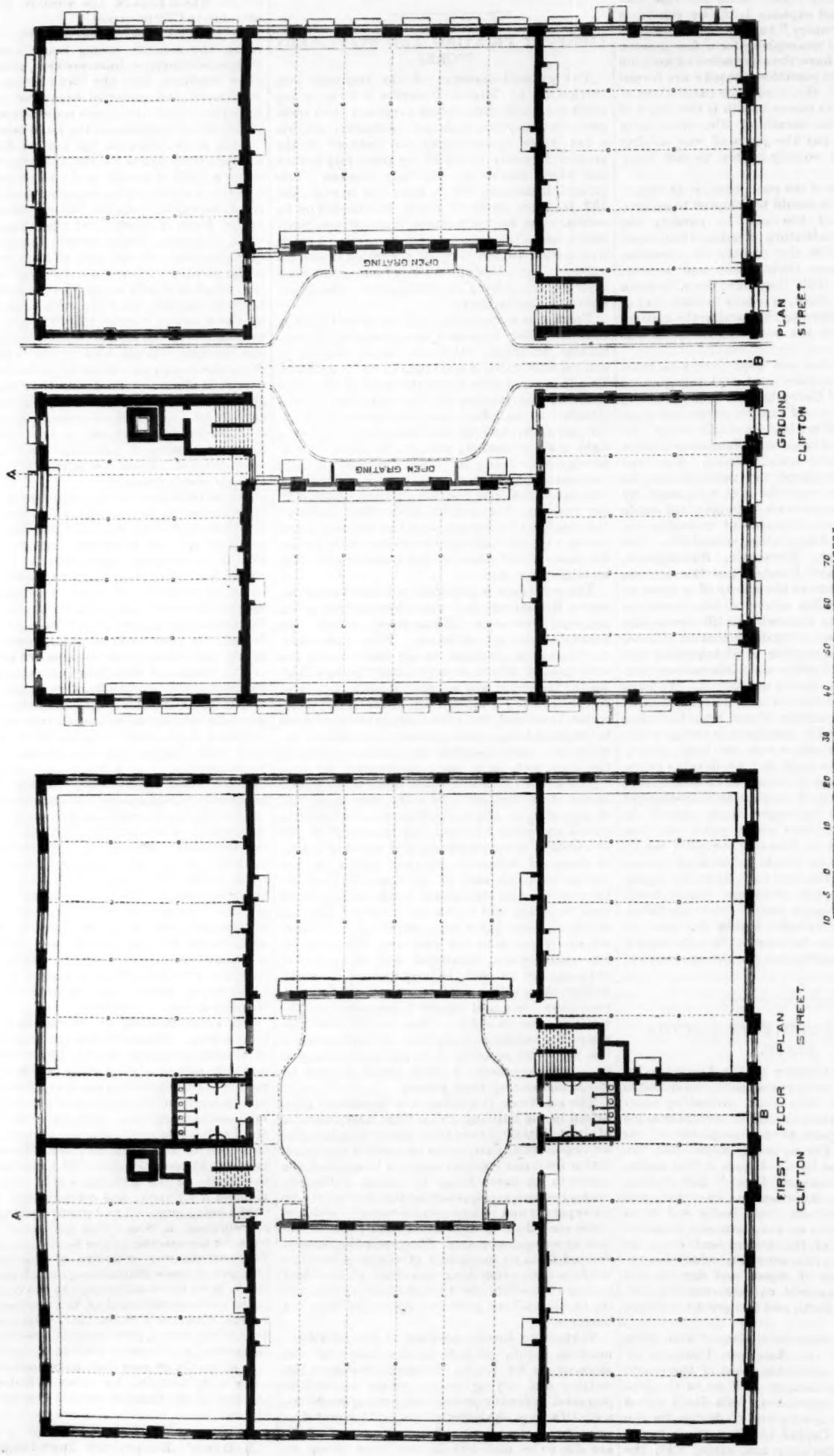
The fourth and fifth floors are occupied by the composing and press staffs. The general arrangements here furnish a remarkable contrast to the provision usually made for compositors. Accommodation is provided for about 300 compositors, with their frames, imposing-tables, and other paraphernalia. A hand-press room, and a stowage room for standing formes, constitute necessary appendages to this department.

The immense machinery called into use throughout the establishment is driven by engines amounting to 85 horse-power, these including a pair of Tangye's horizontal of 50 horse-power. The boilers, which are by Messrs. Horton & Son, of Southwark, are of 106 horse-power. Two well-appointed kitchens are located in different parts of the building for the accommodation of those employed; and the structure is warmed throughout with hot-water supplied from the basement, upon a system of utilising the exhaust steam, and patented by Messrs. Herring & Son, of Chertsey.

The entire building was erected in little more than a year. The walls are constructed entirely of Beart's perforated bricks. The window-heads and sills, and nearly the whole of the ornamental portions of the building, are formed in concrete; and throughout there are many specialties in the mode of construction. The whole was designed and has been erected under the personal superintendence of the architect, Mr. William Ward Lee, of Finsbury-circus. The contractors for the whole of the building works were Messrs. Holland & Hannen; the wrought and cast iron works being supplied and partly fixed by Messrs. R. Moreland & Son. The amount of the contract for the erection of the building was 44,209*l*. This amount was exclusive of the cost of all fittings and trade adaptations, and all machinery. Mr. J. Moth acted as foreman to the contractors, to the entire satisfaction of the architect and of Messrs. Waterlow & Sons. Mr. Hammond, their clerk of the works, gave material assistance from his knowledge of their special trade requirements.

It is worthy of note that, notwithstanding the large area occupied by these premises, some portions of the business are still carried on elsewhere.

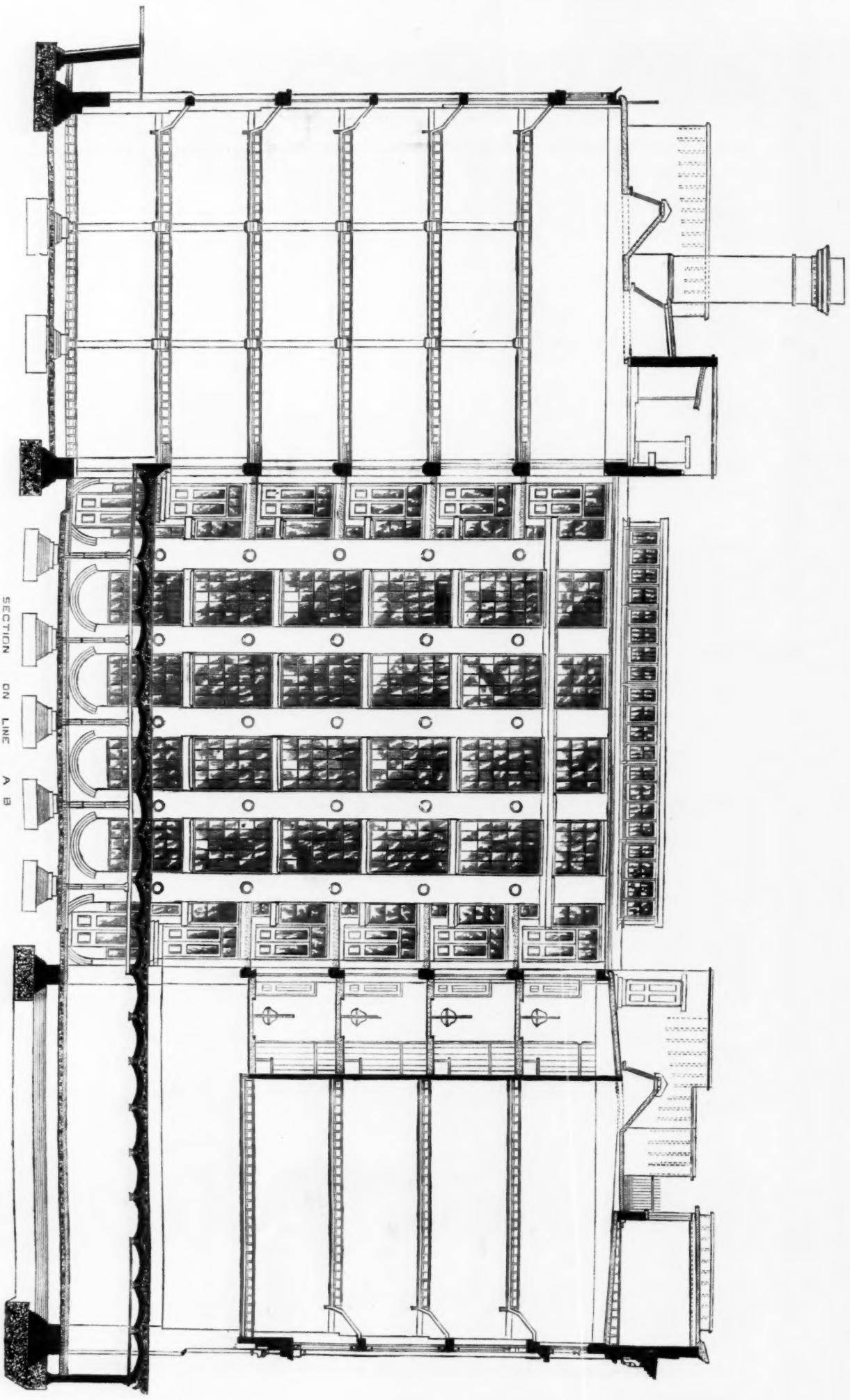
Builders' Benevolent Institution.—The committee of this charity have passed the accounts of the annual ball held last January. The balance-sheet shows a profit of 90*l*., which has been added to the relief fund. A unanimous vote of thanks was given to the honorary secretary, Mr. John T. Bolding.



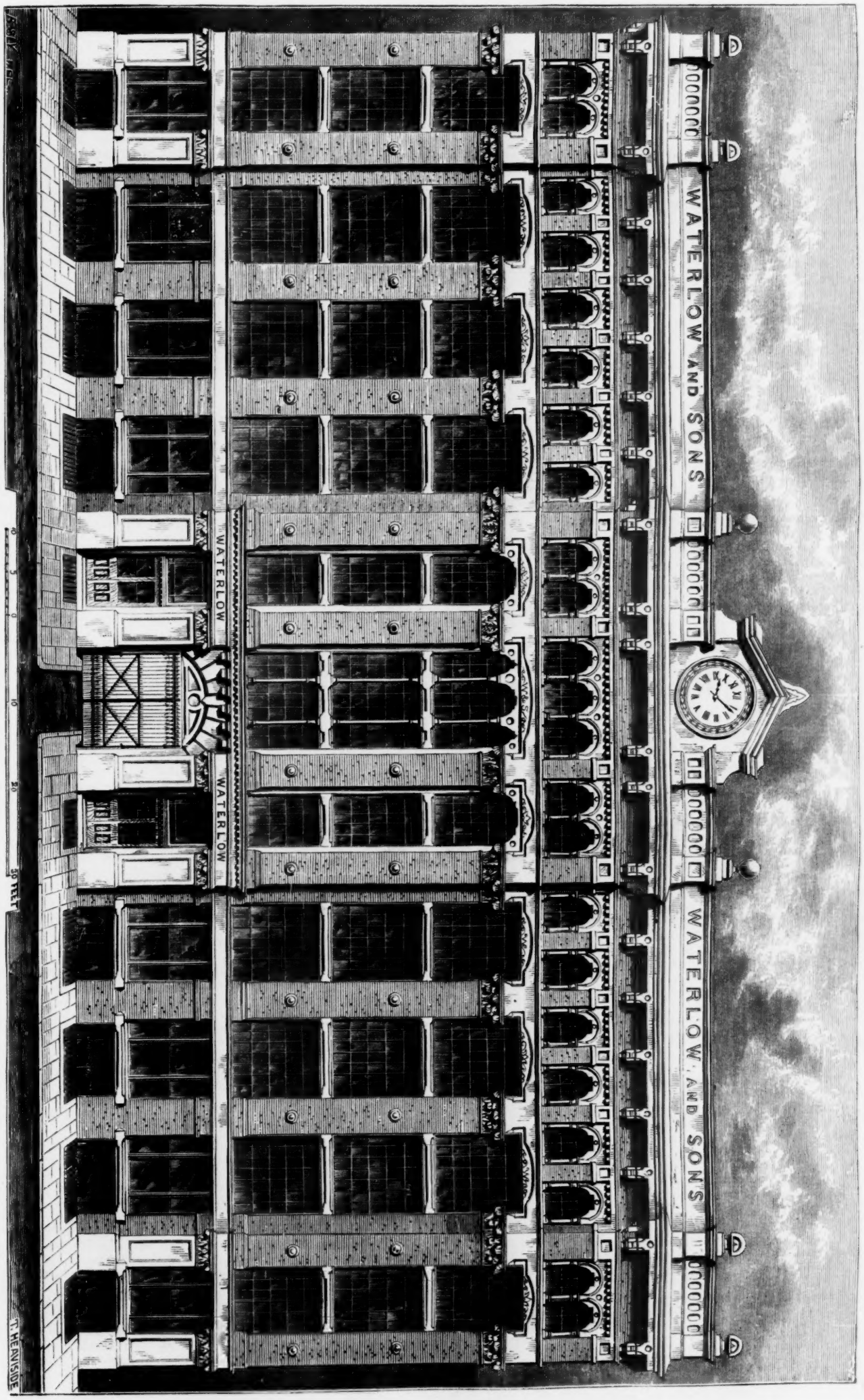
FINSBURY PRINTING AND STATIONERY WORKS.—*Plans.*

GROUND PLAN STREET
CLIFTON

FIRST FLOOR PLAN STREET
CLIFTON



FINSBURY PRINTING AND STATIONERY WORKS.—*Section.*



LONDON BUSINESS PREMISES: THE WORKS OF MESSRS. WATERLOW & SONS, FINSBURY.—MR. WILLIAM WARD LEE, ARCHITECT.

SOUL IN ART.

BY W. PETTIT GRIFFITH, F.S.A.

"A work of art is not a thing inanimated: life exists really in it. It is that sentiment which is found everywhere, and cannot be assigned anywhere. The ancients have excelled in the art of animating their works, only because they possessed that general and complete instruction which sound studies give."—*M. Fould.*

THERE are two kinds of immortality, viz., the celestial and the terrestrial: the former relates to the spiritual and immortal part of man, and the latter constitutes the life and vital principle. My object is to treat only of the life hinted at by M. Fould, which exists in nature and all beautiful works of art, and not

"To search forbidden deeps, where mystery lies
Not to be solved, and useless if it might.
Mysteries are food for angels; they digest
With ease, and find them nutriment."—*Cowper.*

The unenviable immortality claimed by spiritualists, "proved by facts!" maintained by some of the clergy and persons of diseased imaginations, influencing weak minds, only tends to superstitious blindness, of which true immortality knows nothing.

Plato has discoursed of the soul spiritual, and Addison, humorously, but not instructively, enters into the imaginary immortality of men who live in fame and reputation. The general has been considered as the soul of an army, and the common soldiers the body of it; in like manner the architect and the artist may be compared to the soul, and the workmen and materials to the body.

In the present age, facts are required rather than the verbiage of those who

"Ape the great with empty eloquence."—*Plato.*

The Scriptural injunction to "read, mark, learn, and inwardly digest," is worthy of deep meditation, as the food for the mind needs digestion as much as food for the body, and even prior to Christian times we were admonished by Horace to

"Make the Greek authors our supreme delight:
Read them by day, and study them by night."

And in more recent times, Southey, whose library was his world, says:—

"My days among the dead are passed;
Around me I behold,
Where'er these casual eyes are cast
The mighty minds of old:
My never-failing friends are they
With whom I converse night and day."

The following quotation clearly points the difference between a terrestrial and a celestial crown. In many places in Scripture where the word "crown" occurs, it means a garland. Of this there is a striking instance in the text, 1 Peter v. 4, "And when the Chief Shepherd shall appear, ye shall receive a crown of glory that fadeth not away." In the Greek text, the expression is, an amaranthine crown, or, as it may be rendered, "an evergreen garland." And the same Greek word for crown is also used in the passage, 1 Cor. ix. 25, where St. Paul alludes to the exertions of the athletes in the Stadium:—"Now they do it to obtain a corruptible crown," that is, a garland made of leaves, which would soon wither.

All those works of every kind which portray truthfully the subject they treat of will remain guides for future generations. Education is generally conducted by three channels, viz.:—1. Truth itself, uncoloured; 2. Possible or probable truth; 3. Perverted truth.

1. Of truth itself, we have the Holy Scriptures, Shakspeare's works, all works on science, natural history, most of the British poets, English classics, &c.

2. Possible or probable truth, as illustrated by Sir Walter Scott's works, Miss Mitford's, Ainsworth's, &c., and a large class of moral and religious works.

3. Perverted truth, Lord Byron's works, Milton's, &c., and a large class of works of fiction, such as fairy tales and exaggerated novels.

Of course, truth itself should be powerfully enforced and maintained; then, as an auxiliary, possible or probable truth may be entertained, but perverted truth must be peremptorily shunned.

It has been urged that truth is the very soul of all art, and whenever it is discarded, art at once becomes dead and corruptible.

The fanciful hypotheses, interesting and poetical as they are, relating to the symbolic indications of the immortality of the soul, are, singularly enough, based upon earthly objects. Inwood, in 1834,* alludes to an Egyptian mummy as resembling a chrysalis, under the impression of its awaiting in that state its period of entering and rising to another existence.

The gross absurdity, in an enlightened age, of employing the names of pagan divinities to designate heavenly bodies is self-evident. Now, as

"Night ope's the noblest scenes, and sheds an awe,
Which gives those venerable scenes full weight,
And deep reception in the entender'd heart,"

the best and surest index to another existence, requiring no puerile earthly symbols,—such as mummies, butterflies, serpents, or the oak, vine, ivy, &c.,—is a free view of the whole hemisphere, without moon or cloud, and without any obstacle from below,—the mountains being nature's monuments, their heaven-pointing elevations convey the spirit onward towards eternity. To see the planets, one after another, light up their lamps; the stars advancing in their glittering train, and thousands of luminaries shining forth in successive splendours, form the surest and most impressive means of conveying to the mind a tangible idea of immortality,—

"Even silent night proclaims my soul immortal!"
Young.

It is deeply to be lamented that the foregoing beautiful panorama, so eminently calculated to guide the mind to grasp an unerring notion of immortality, is completely marred by a false system of education. In early days, when natural science was scarcely known, and when it occupied months, and even years, to spread knowledge, it was natural that man should have recourse to an earthly nomenclature, using the most unnatural arbitrary terms to designate the heavenly bodies. A teacher taking advantage of a beautiful evening gives his pupils an astronomical lecture; he commences by pointing out, to the astonishment of his beginners, a great and little bear, dragon, hounds, goose, wagon and horses, plough, goat, sculptor's shop, &c., and he then poisons their minds with heathen mythology, a knowledge of which they would be better without, and directs attention to the planets by designating them as Venus, Jupiter, Mars, &c., forgetting that

"All truth is from the sempiternal source
Of light divine. But Egypt, Greece, and Rome
Drew from the stream below."—*Cowper.*

Confirmed by Byron, who says:—

——"He who studies fervently the skies,
Turns oftener to his stars than to his book."

It is to be hoped that the time will come when the whole system of teaching astronomy will be reconstructed, either by a numerical or other arrangement; for Nature, with all her wildness, has

"Varieties too regular for chance."

The most beautiful objects in nature and art should be closely studied, as the living soul can learn nothing from soulless specimens, which are by far too numerous in the art-world,—

"Better for man
Were he and Nature more familiar friends!"

The human soul was originally formed with a self-directing power, to turn its attention to whatever it thinks proper, good or bad. The first impressions were wholly derived from nature, and more or less ever afterwards. The lamp in our street is only analogous to the glow-worm in the hedge, and the chandelier in our rooms is identical with Nature's contrivances, only artistically treated. Dr. Buchanan says that the birds that build hanging nests are at Cape Cormorin numerous. At night, each of their little habitations is lighted up, as if to see company. The sagacious little bird fastens a bit of clay to the top of the nest, and then picks up a fire-fly, and sticks it on the clay to illuminate the dwelling, which consists of two rooms. Sometimes there are three or four fire-flies, and their blaze of light in the little cell dazzles the eyes of the bats, which often kill the young of these birds. These insects impart no imaginary light: when Sir Thomas Cavendish and Sir Robert Dudley landed in the West Indies, they saw in the evening a number of moving lights in the woods, which, though only fire-flies, were supposed by them to be Spaniards advancing by torchlight, and they immediately took to their ships.

The term inanimate, often applied to inferior works of art, at once pronounces their soulless nature. The sculptures of Phidias and the floral carvings of the Middle Ages form a contrast to the above, life existing really in them; they are, therefore, immortal. All the great arts require a subtle and speculative research into the law of Nature, which accounts for the Greeks possessing that loftiness of thought and perfect mastery over every subject, derived from such source as this. Pericles possessed, in addition to the above acquirements, a great natural genius.

The most eminent artists always affected to insert their names in their works, in order to partake of the immortality they gave others. Phidias not being permitted to put his name upon the pedestal of his Minerva at Athens, cut his portrait upon the goddess's shield. Myton, to immortalise his name, put it in almost imperceptible characters on one of the thighs of the statue of Apollo. Pliny relates, that two Lacedæmonian architects,—Saurus and Batrachus,—without reward, built temples in Rome, flattering themselves that they might affix their names upon them; this being absolutely refused, it being considered *infra dig.* to be associated with simple workmen, the architects sculptured, by way of ornament, lizards and frogs upon the bases and capitals of all the columns. The name of Saurus implying the lizard, and Batrachus the frog.

The action of breathing in antique sculpture † was represented in the first state of earlier Greek art by a heaving breast with the lips closed, as in the Apollo of Tenea. A further advance was marked by the opening of the mouth, which, however, was done in an imperfect manner, chiefly by protruding the underlip. Phidias and his followers continued both these modes of expression with characteristic finish and grandeur. Those works in which the influence of Praxiteles is visible, on the other hand, show only a very slight expansion of the breast, while the protruded underlip entirely disappears. This agrees perfectly with that graceful *laissé-aller* which forms a chief characteristic of the works of this excellent school. In the next state of development, as introduced by Lysippos, the action of breathing leaves no impression on the lower part of the body, while its surface, showing the veins, skin, muscles, is rendered with exquisite life-like accuracy. In the time of Alexander the closed lips occur again, but seemingly only in portrait busts, while the statues of gods and heroes preserved their classical traditions.

The lifeless representations in the infancy of art by the Egyptians, who always exhibited the figure with its weight equally poised upon both legs, so that its position was regularly and rigidly erect, may be contrasted with the ease, grace, elegance, and dignity of attitude and gesture which are so much admired in the life-like Greek statues. Socrates said that an excellent statuary must represent the actions of the soul by the motions of the body.

An art, however excellent in itself, may be abused; for instance, the nudity of sculptural figures, and representations contrary to modesty indulged in by the Greeks. These abuses committed by the so-called Pagans are not so grave as many perpetrated by scientific and learned Christians. Some years since a surgeon incautiously asserted that he had dissected numerous human bodies, and had never discovered a soul! Of course, he regretted it, and the book was withdrawn. Charles Lamb (Elia) foolishly stated that "a garden was the prison, till man, with Promethean felicity and boldness, luckily sinned himself out of it."

These random remarks prove Hamlet's assertion, that—

"Words without thoughts never to heaven go."

There is, says Dean Sherlock, a great difference and distinction between soul and body, which men who are sunk into flesh and sense are apt to forget; nay, to lose the very notion and belief of it. All their delights are fleshly. They know no other pleasures but what their five senses furnish them with. They cannot raise their thoughts above this body, nor entertain any noble design, and therefore they imagine that they are no more than flesh and blood, a little organised and animated clay; and it is no great wonder that men who feel the workings and motions of no higher principle of life within them but flesh and sense, should imagine that they are nothing but flesh themselves.

The vitality ever constant in the works of nature, and perceived by an educated eye, should be embodied in works of art. Virgil in Æneid, book vi., was alive to this sentiment, when he says,—

"Others shall best inspire the mimic brass,
Or out of marble carve a living face."

And again says,—

"In living sculpture might be seen
The mad affection of the Cretan queen."

Hervey † also alludes to life in art, when he says

* Of the Resources of Design in the Architecture of Greece.

* Helbig, in the "Grenzboten," No. 50.

† Meditations and Contemplations.

"a piece of statuary that seems, amidst all the recommendations of exact proportion and graceful attitude, to soften into flesh, and almost breathe with life."

A close examination and study of nature is required to successfully animate works of art. If animal forms be selected and introduced, a knowledge of anatomy and the varied movements must be obtained; and if vegetable forms be used, the trunks and branches of trees ought to be freely handled, avoiding formal or straight lines. In all the varieties of foliage the disposition of the stems and veins ought to be closely observed and portrayed, not tamely, but in a spirited manner indicating life. Thus a well-disciplined mind soon distinguishes between a spiritless inanimate production and a carefully-studied object in which all the laws culled from nature are embodied.

The most prominent characteristic of nature is an overflowing and exhaustless vital energy; that of art is spiritual unity, harmony, and symmetry. It is the province of the architect to unite art and nature. From nature intellect desires richness, comprehensiveness, and living energy, while art frames harmonious regulations, and points out the laws of the beautiful. Nature is a book, and every page rich with sacred hints. To an attentive mind the garden turns preacher, and its blooming tenants are so many lively sermons.

Without educated reason nature would stray and fluctuate without end or intention, or become perfectly disjointed and out of frame. All things are made subservient to man, and he receives use and benefit from them all.

Sagacity in animals varies. Oysters and some other shell-fish are considered to have but a small sensation. Some animals have a sharper sensation than men: horses, dogs, beavers, foxes, ants, bees, apes, have surprising sagacity, and approach toward reason. It is not, however, the want of speech that hinders them from reasoning, as some pretend. Parrots can easily be taught to speak, but not to reason. The difference, then, between these animals and men consists in the latter having immortal souls capable of religion, and of knowing Scriptural views; whilst animals confine all their knowledge, designs, and cares to temporal happiness, the preservation of their bodies, and propagation of their species.

Although genius, or a natural gift, cannot be imparted to an artist by man, still art can be taught; assertions to the contrary must exercise a depressing influence on all students in Government and other schools of art. The Bible says that "there is a spirit in man, and the inspiration of God giveth understanding": consequently all can be taught, although every one may not be inspired; but that is no argument for not teaching art. Mere enthusiasm will carry an artist but a little way, still students ought not to be discouraged, even *ex cathedrâ*, by such declarations as "we hear so much nowadays of natural laws, averages, and systems, by the side of which mere individual efforts are futile as a fly on the wheel of some vast engine."

Therefore, let no student in architecture, painting, or sculpture be discouraged by the "emphatic" declaration of one professor, that "art cannot be taught," or by the denouncement of a Royal Academic professor against "mere individual efforts." The lives of such men as Michelangelo and Sir Joshua Reynolds eminently prove the value of personal exertion in a right direction by studying the works of Nature, and not by ignoring them. "Nature is the art of God, and must for ever be unrivalled by the sons of men."

Sir Joshua Reynolds says that a comprehensive and critical knowledge of the works of nature is the only source of beauty and grandeur, and that that power which enables the artist to conceive his subject with dignity may be said to belong to general education. Whatever sublime ideas may fill his mind, he can put in practice only what he knows, and communicate those ideas by visible representation.

Plato treats this subject with great perspicuity, as to whether virtue and music and the other arts can be taught. He wisely says that the man's son who happened to have the best natural talent would rise to distinction, and the man's son who had no such natural talent would be undistinguished; and further, that all would be sufficiently taught compared with those who are untaught, and who know nothing, but who may be considered as savages.

Locke says, that of all the men we meet with, nine parts of ten are what they are, good or evil, useful or not, by their education.

The art of painting was originally sought to reflect the divinity that is in nature, and its early office was that of adorning the sacred edifices of the Christian faith, and placing the mysteries of religion more clearly before the eyes of untutored men than could be effected by words alone; it, however, ere long became frivolous and unmeaning, and degenerated into uninteresting and commonplace generalities.

Painting statues of a flesh colour, with artifical eyes, red eyebrows, red and brown hair, &c., may be attractive and useful in the barber's shop, and painting green vine-leaves and grapes on the capitals of public-house columns may be in accordance with popular notions of nature, but very far from the purpose of this paper, in portraying life in art.

Painting ought never to be employed in lieu of sculpture in a building. Sculpture more successfully embodies the ever-springing life, the inexhaustible strength of nature, and gives the simplest imitation of material forms; but painting will mistake her own peculiar province, if, instead of following the track of the old masters, she diverges from it to pursue the objects more peculiarly appertaining to sculpture, which must result only in vain, delusive attempts, or in producing a feeble and sickly shadow of the antique; painting must be painting, and nothing else.

The strokes of the chisel animate marble and brass, and the mixture of colours portray nature to the life. Sculpture and painting were consecrated to the memory of great men to express their glorious actions, so that by perpetuating the remembrance, inspired at the same time an ardent desire of living artists to imitate them.

In former times the history of nations, and the principles of science, were often marked in inscriptions, or superscriptions on altars, columns, marbles, and coins.

Without sculpture and painting an edifice would be an inanimate production,—

> "'Tis not timber, lead, and stone,
> An architect requires alone
> To finish a fine building:
> The palace were but half complete
> If he could possibly forget
> The carving and the gilding."
> *Cowper.*

The great interest attached to Jerusalem, its temples, and history, and so carefully recorded in the Scriptures, and all works of art, is of only a transient nature, compared with the immortality of the New Jerusalem, wherein are no temples, neither sun, nor moon, but the light of everlasting intelligence.

Sir Thomas Browne said that the world was made to be inhabited by beasts, but studied and contemplated by man; he believed that the whole frame of a beast perishes, and is left in the same state after death as before it was materialled into life; and that the souls of men know nothing contrary, nor corruption; that they subsist beyond the body, and outlive death by the privilege of their proper natures, and without a miracle.

In conclusion, notwithstanding the infinite perishableness of the whole material world, in which nothing is eternal except reason, and the creative power revealed in it, if the soul in art be continued from generation to generation, it must be immortal; it now exists, and will exist throughout all time. Denon, in a conversation with Napoleon in the Louvre, alluding to a picture as being immortal, Napoleon inquired how long it would last. "Perhaps 500 years," was Denon's reply, "and, if a statue, 5,000 years." "And this," said Napoleon, "you call immortality!"

The folly of connecting immortality with marble monuments, tablets, &c., has been wisely pointed out by Cowley,—

> "Here lies the great;—false marble, where?
> Nothing but poor sordid dust lies here."

Engrave not with hammer and chisel on outward tables of stone, but inwards, on the tables of our hearts. What a poor substitute for memorable actions is polished alabaster, or the mimicry of sculptured marble! Let all write on the minds of their countrymen, and be remembered with applause, as long as the nation lasts, without artificial expedients to perpetuate good deeds.

The Scriptures say, that all who "were honoured in their generations, and were the glory of their times, have left a name behind them, that their praises might be reported;" "and some there be, who have no memorial, who are perished as though they had never been, and are become as though they had never been born."

Marble tablets endure for only a few years; brass, copper, stone, all corrode and decay; books, with all care, become worm-eaten, and succumb to the elements, verifying Scripture,—"The dust shall return to the earth as it was, and the spirit shall return to God, who gave it." The only endurable tablet to engrave upon is the human mind, which alone is immortal. Thus the great importance of education. Educate and elevate the mind from generation to generation, not merely with the knowledge of to-day, but that of all times. Thus thought and imagination, matured by scientific knowledge, can alone discern eternity through the light of stars, the real everlasting flowers, inextinguishable and unfading, although invisible by day.

THE SILK-GROWING INDUSTRY IN AUSTRALIA AND NEW ZEALAND.

ON the 26th ult., at the Society of Arts, Mrs. Bladen Neill read a paper on this subject, the Duke of Manchester in the chair.

We have already given some account of this lady's endeavours to obtain aid in England for the experiment which is being made in Australia. Mrs. Neill said,—Several years ago, while on board one of the steamers of the Peninsular and Oriental Company, I had the fortune to meet with a French gentleman who was on his way to Japan to purchase silkworm eggs, or "grain." At that time the silk-growing industries of the South of Europe were suffering greatly from the diseased state of the "grain," and a tremendous impetus was thus given to the importation from Japan of healthy grain, to supply the silk-growers of Italy and France. The Frenchman had made several enterprising journeys to various countries in search of healthy grain, and in the course of his wanderings he had visited some parts of Australia, and he expressed a very strong opinion that the cultivation of the mulberry and the growing of silk ought to do very well there. The experiment had certainly been tried in several parts of Australia long before I determined to take it up, but it had not been worked out to the point for making it become a national industry; and it was this latter view which the suggestions of my French *compagnon de voyage* led me to attempt. All the world knew that Japan had developed an enormous and most profitable trade in the export of silkworm eggs to Europe, and I could not see why the British colonies should not do the same. I subsequently started a plantation of mulberry trees on my own property on the Murray River in New South Wales, and in course of time a number of ladies in Melbourne and other parts of Victoria, encouraged by my success, formed the "Victorian Ladies' Sericicultural Company, Limited." In connexion with this company I made a journey to the silk-growing districts of Southern Europe, and through my instrumentality the famous race of silkworms cultivated by M. Roland, of Orbe, was introduced into Australia. It is unnecessary for my present purpose to detail the method adopted by M. Roland in his celebrated magnanerie; suffice it to say that the effect of his system has resulted, for many years past, in the production of a race of silkworms which has remained healthy while the breeds of other silk-growers in the South of Europe have for years suffered terribly from the disease to which the silkworm is liable. Thus we have been fortunate, in Australia, to secure the introduction of the best known system of treating the silkworm, so as to get a healthy and vigorous race, and this may fairly be credited to me as a valuable commercial result. The best kinds of mulberry trees have been introduced into Australia in larger quantities than formerly was the case, and the planting of the trees has, through the agency of our company, been widely spread throughout the colonies to which I refer. We have established a silk farm and plantation at Mount Alexander, about seventy miles from Melbourne, and have obtained a Government grant of 1,000 acres of land there for this purpose. We have also opened up in Italy an assured market for as many cocoons and silkworm eggs as our means may enable us to grow, and among the results already achieved in this movement I look upon the Italian market as a very great step indeed, because it is the evidence of local prejudices against our produce having been overcome in Italy, and of the good opinion of acute and critical judges in that country having been secured. I have already published in the *Journal of the Society of Arts* the certificates from Italian experts which substantiate these remarks, and I have the original certificates in my possession, which thus conclusively prove that the quality of the Australian

cocoons and "grain" is so high as to justify us in trying to extend the industry which produces them. Good business prospects are thus open to us in Italy,—the largest silk market in the world,—but we want capital to enable us to take full advantage of such an opening. But I do not propose to begin with an export trade in grain; it will be sufficient to begin by developing our export of cocoons to Italy, where the trained labour of that country will prepare the silk for our English buyers. I have always thought, and I am still strongly of opinion, that in course of time our own women and girls, and particularly those of the educated classes, will be able to undertake even the reeling and other processes of the silk business, which for centuries have been specialities in Italy and the South of France; but, although I should like to see this attempted at once in England on a large scale, I do not here propose it. We must be content to let the thing grow.

But it is not only in Italy that our Australian silk produce has earned high commendation. Various articles of clothing, stuff, and woven fabrics have been made for experimental purposes here in England; and I take this opportunity to ask our noble chairman to accept, as a specimen of our work, a pair of socks, made by gentlewomen who are working with me, out of silk "refuse" from the sunny land of Victoria.

Some of the manufactured goods of which I now exhibit samples have been kindly worked up from our silk by Messrs. Brocklehurst, and Messrs. Potts, Wright, & Co., of Macclesfield, and I take this opportunity of acknowledging the deep gratitude of myself and my lady-coadjutors for the assistance we have received from these gentlemen. When I am asked for results from my recent exertions in England, I think it will be almost in itself sufficient to point to this proof of the estimation in which our present movement is held by the accredited representatives of the silk trade of Macclesfield, and I hope it will be influentially taken up.

I think I have said enough to show that this business has in it the making of a solid thing. Thus far, what has been done has been effected with much struggling and difficulty by a handful of women, and with very insufficient means. We believe that it must be carried through on a large scale, and we want the assistance of practical men and money. We want, above all, to largely increase our mulberry plantations in Australia, and we are open to enter into any reasonable undertaking to indemnify those who may advance the capital required for the purpose. So far as I am able to understand matters of this nature, the most feasible scheme appears to be to raise a company here, with, say, 50,000 shares of 1*l.* each, the price of the shares being intentionally kept as small as possible to enable women to join in the enterprise, because we always keep prominently in view the fact that the rearing of silk-worms, even on a large commercial scale, is eminently a woman's work, without reckoning the various collateral industries which we hope may eventually grow out of it, in working up the refuse silk in various forms. The leaf season lasts in many parts nearly ten months, in others eight and nine months. Numerous educations can be made annually, which will largely increase the profits. The limits of the time allowed to me here will, I fear, prevent me from going into the details of the commercial aspect of such a company as I propose, but I have with me, in writing, a calculation based upon experience of the cost of silk culture in Australia, and of the estimated labour profits. The very important question of labour remains only to be mentioned, and it may, perhaps, surprise you all to hear that an education of 12 ounces of grain (eggs) with the rapid Cavalloni system, can be made at considerably less cost in Australia than in Italy, and I say this from practical experience, having resided on a large estate near Verona last season, where I studied the cost of everything connected with silk-growing.

An Australian silk-growers' depôt has been started at 7, Charles-street, Grosvenor-square. This depôt will be a boon to small silk-growers, who will thus be able to dispose of their produce to the best possible advantage. Useful articles, such as socks, stockings, &c., made by gentlewomen, will be sold, and ladies are invited to visit the depôt, where also they can obtain full particulars of the Victorian Ladies' Association.

In the course of the discussion which followed, Mr. W. C. Brocklehurst (M.P. for Macclesfield) said he would like to make a few remarks on this question from a practical point of view, being largely engaged in the silk manufacture. He should be happy at any time to carry out any suggestions made by Mrs. Neill. It was well known that the silk manufacture was introduced into this country by Protestant refugees from France, who settled in Spitalfields, and afterwards spread to Macclesfield, Congleton, Derby, Manchester, and other places. Up to 1860 the trade was very flourishing, but then, in consequence of Mr. Cobden's French treaty, the protective duties were abolished, smuggled silks were no longer in fashion, and what was of more consequence, the trade became much depressed, though he must confess at the same time that the treaty was very beneficial to the country at large. About the same time, however, there appeared that mysterious silkworm disease of which no one knew the nature, and for which there was no remedy. The effect was to diminish the supply of silk, and therefore the silk trade in England had not been so flourishing as it was prior to 1860; though, according to the census of 1861, there were still more than 100,000 persons directly engaged in it. He had tested practically the specimens brought forward by Mrs. Neill, and had seen letters from different people connected with the trade, in which they said that this silk was as good as, if not better than, the best silk produced in Europe in its most palmy days. He found on referring to the Blue Books, that in 1861 the import of silk was 8,710,000 lb., of which 4,096,000 lb. were re-exported, leaving 4,600,000 lb. for home consumption, whilst in 1874 the import had fallen to 5,911,000 lb., of which 2,741,000 lb. were re-exported, leaving only 3,170,000 lb. for home consumption. Of course, it became a serious question how this falling off was to be remedied, and he could only say that the best method seemed to be by encouraging in every possible way the production in Australia. He did not say the cocoons produced could be brought here to be reeled, because probably the cost of labour would be too high, but they might be sent to France and Italy for that purpose, and afterwards manufactured in England. Another important point was the deterioration in the quality. The reelers in India, China, and Japan had taken advantage of the scarcity, and had endeavoured to produce quantity rather than quality, so that at the present moment there was no good silk to be had, but only bad European and worse Asiatic, the consequence of which was that ladies complained that silk dresses did not wear nearly so well as they used to; they turned to other fabrics, and silk to a great extent had gone out of fashion. If they could get good silk from Australia, it would be the means of bringing the trade back again, and they would again see ladies walking in silk attire, in which he thought they looked better than in anything else. Owing to this deterioration also there had been malpractices introduced into the manufacture and dyeing of silk, and a lady's dress would consist of one-fourth its weight of silk and three-fourths of something else, which in the course of a few weeks' wear caused it to come to pieces. The next question was, how were they to get this Australian silk? and though he had listened with great interest to Mrs. Neill's remarks, he had not heard any very practical suggestions on this head. However, he thought if that lady would condescend to accept the aid of three or four practical men, it might easily be accomplished. A company might be formed in this country connected with the Governments in the colonies, and the cocoons and seed might be sent to Italy, to France, and even to Broussa in Asia, where it might be reeled, and the "dead bodies," which were in reality the refuse, might very well be brought here and worked up profitably by those ladies of whom Mrs. Neill had spoken so feelingly. The idea was that a company should be formed with a capital of 50,000*l.*, of which one-fourth should be called up, and this would be amply sufficient for the experiment. Mr. Clayton, the manager of the Government silk farm in Western Australia, wrote to say that the Government had placed in his hands sufficient funds to carry on the operations, and that the Colonial Secretary, the Hon. Mr. Barlee, had promised a reward of 500*l.* to the person who produced the first bale of silk in that colony.

Lord Alfred Churchill believed the day was not far distant when there would be hundreds of thousands of spindles in England spinning Australian silk, and they would then look back to the present evening as one of the greatest importance, and of the most happy augury for the trade of this country; but in order to do this, the commercial element must be separated from the philanthropic. He entirely agreed with all Mrs. Neill had said as to the desirability of aiding the ladies of this country, but that was a separate question, and must not be looked upon as the reason for supporting silk culture in Australia.

DYNAMITE: ITS IMPORTANCE AND DANGEROUS NATURE.

UNDER this title, a pamphlet has been published by Captain Isidor Trausl, of the Austrian Engineers, which gives a short history of all explosive substances that have come into use within recent times, by the side of the old powder. Few branches of engineering have, until quite recently, proved of such stability as that of explosive substances. The powder used in the last Franco-German war, the blasting material which served in the tunnelling of Mont Cenis, were of almost the same composition as the explosive substances which came into general use during the great conflicts of the fifteenth century, as that powder with which Martin Weigold in 1613 made his first experiments in the mines of Saxony. The old gun and rifle powder answered pretty nearly all requirements of the artillerist and the rifleman until the time when, in the train of the American civil war, that mad duel between guns and armour plates began which led to the gigantic calibres of modern times.

But what has been neglected by centuries of stagnation seems now to be retrieved by rapid progress, greatly affecting a series of branches of civil and military engineering. Although hardly ten years ago black powder was the exclusive motive force applied for blasting purposes, at the present day already a great portion of its former province has been alienated from it. It was tried at first, though to no purpose, to supply the ingredients of the old powder by more efficacious materials. Well-combined charges in size, shape, nature of surface, density, and hardness of the single grains of powder were soon found, however, to satisfy all the increased requirements which were made on the motive power of gunpowder. Since then powder has continued to be exclusively applied in propelling projectiles, and all explosive substances invented lately have been used only either for torpedoes or for mining and other peaceful purposes. In 1838, M. Pelouze discovered that cotton may be changed into an explosive substance; and in 1846 Schönbein, who had found a practical method for such a change, brought to public notice the invention of gun-cotton. But when, in 1865, a large gun-cotton magazine near Vienna was blown up, its use began to decline. Almost at the same time that Schönbein published his invention, a young Italian professor of chemistry, Sobrero, discovered in the lavatory of Pelouze, at Paris, the most fearful explosive known, nitro-glycerine. On account of its dangerous nature and the difficulty of igniting it at pleasure, however, it found no practical utilisation until the Swedish engineer, Alfred Nobel, discovered in 1867 a means of imparting to nitro-glycerine a more suitable form for manipulating it, by impregnating a porous infusorial earth with about 75 per cent. of it, and at the same time of depriving it of part of its dangerous property.

This new explosive, named dynamite by Nobel, obtained within a few years an extraordinary extension. In the twenty dynamite manufactories under the supervision of the inventor, there were produced, in 1867, 220 cwt., which production rose, in 1868, to 1,560 cwt.; 1869, 3,700; 1870, 8,480; 1871, 15,700; 1872, 27,000; 1873, 41,000; 1874, 62,400; and in 1875, to 80,000 cwt. The consumption of dynamite will, in 1876, probably exceed 100,000 cwt., a quantity which in explosive force is equal to a quarter of a million cwt. of ordinary gunpowder. The relative magnitude of this number will be made clear to the uninitiated when we say that the total manufacture of gunpowder by the four great military states of the Continent amounts to about half a million cwt. The proportions of the different effects of known explosives to each other may best be illustrated by stating that, if we reckon the explosive force of ordinary powder, as 1, that of the better description of gunpowder prepared with a larger quantity of saltpetre and charcoal made of water-elder, will be represented by 3; lithofracteur by 5, and dynamite by 6 to 7.

The author of the pamphlet is of opinion that the transport of explosive substances, provided the necessary precautionary measures are taken, will also have to be permitted on German railways, as this, for instance, is already the case in Austria, since all prohibitory obstacles have had

the result of clandestine transport of explosives and more frequent accidents. According to his view, dynamite in a frozen state (it freezes at + 8° C.) is much less dangerous than ordinary gunpowder, as it, in case of ignition by fire, flashes away in small quantities, but does not explode.

THE DHU HEARTACH LIGHTHOUSE.

THE INSTITUTION OF CIVIL ENGINEERS.

At a recent meeting a paper was read descriptive of "The Dhu Heartach Lighthouse," by Mr. David Alan Stevenson, B.Sc. The paper showed that this lighthouse tower, the erection of which had been recently completed by the Commissioners of Northern Lighthouses, occupied an important position with regard to the navigation of the west coast of Scotland. The rock was fourteen miles from the Shore Station at Isle Earraid, in Mull, the nearest land. The main rock was a mass of trap, 240 ft. long and 130 ft. broad, with a rounded top rising to 35 ft. above high-water spring tides, and it was surrounded on all sides by deep water. The tower was a parabolic frustum surmounted by a plain cavetto, abacus, and parapet, the upper course of which was 107½ ft. above the foundation. The diameter of the tower at the base was 36 ft., that of the top being 16 ft. The doorway was 32 ft. above the foundation, and there were six compartments, affording accommodation equal to 5,500 cubic feet. The whole weight of the tower was 3,115 tons, of which 1,840 were contained in the solid base. The tower was constructed of grey granite, of excellent quality, quarried in the immediate vicinity of the Shore Station.

Authority to begin the works was obtained in March, 1867, and, short as the season's work necessarily was, the excavation of the foundation was begun, and the first tier of the malleable iron barrack for the accommodation of the workmen, deemed necessary on account of the difficulty of landing, was erected. The winter of 1867 was employed in building the attending steamer, lighters, cranes, and other plant. Landings were effected on thirty-eight days in 1868, during which the barrack was completed, and three-fourths of the foundation excavated. The shore works at Earraid were vigorously carried on, the quarries fully opened out, part of the foundation course was dressed, and the dwelling-houses were far advanced. In 1869 landings were effected on sixty days. On the 24th of June the first stones were landed. Part of the third course had been completed when a gale arose, on the 8th and 9th of July, which tore up fourteen stones, each weighing two tons, which had been laid in Portland cement and joggled: eleven of them were washed off the rock into deep water, and this at a level of 35½ ft. above high water. Other proofs of the extreme violence of the sea at Dhu Heartach were recorded in the paper. A description was given of a submarine valley, or funnel-shaped track, to the westward of Dhu Heartach, which the author suggested might account for the abnormal sea at this situation. By the end of this season the fifth course had been completed. On shore, dwellings for five families had been finished, and seventeen courses of the tower were dressed. The stones were built dry on a fitting platform, and then transferred to lighters, and towed out to the rock. The lighters carried sixteen tons, and the steamer took out two at a time. Three hours were occupied on the journey out, but on exceptionally fine days two trips were made. On the rock the tramway and all the cranes were worked by steam, the stones being built in as soon as they were landed, in case a gale should spring up. Square ribbon, cast and malleable iron joggles, were used in various parts of the work. The number of days on which landings could be made in 1870 was sixty-two, and by the end of this season the thirty-first course was finished. The works ashore were pushed on, and contracts for the lantern and apparatus were entered into. In 1871, landings on thirty-seven days were effected, the masonry of the tower was completed, as also the whole of the dwelling-houses at Earraid.

The fitting up of the lantern, optical apparatus, fog-bell, and internal fittings were executed in 1872. Two Portland cement beacons at Earraid were erected. The light, which was 145 ft. above the sea, giving a range of eighteen nautical miles, was exhibited on November 1st. The apparatus was first order dioptric, showing a white light, except over an arc of seven points, which was red. The fog-bell was made distinctive from that of Skerryvore. In addition to the lighthouse, the works included nine dwelling-houses, for the lightkeepers and crews of the attending steamers. The cost might be approximately apportioned thus:—

Tower, lantern, apparatus, and fog-bell machinery...	£65,784	9	7
Shore establishment	10,300	0	0
	£76,084	9	7

BACH'S MASS IN B MINOR.

We may go a little out of our way to chronicle an event of no small importance in the sister art of music; the introduction to an English audience for the first time of one of the greatest productions of sacred music, which has had to wait nearly a century and a half for public recognition and performance in this country. Its production now is due to the disinterested labours of Mr. Otto Goldschmidt, and of a choir of enthusiastic and painstaking amateurs, who have been diligently rehearsing for some months back, and whose performances at a special private rehearsal at Cromwell House (where, through the kindness of Mrs. C. J. Freake, all the previous rehearsals had taken place), we referred to in a note a week or two since. As there was some little doubt felt and expressed on that occasion as to the entire success of the public performance, it is the more gratifying to be able to record that the first public performance of the Mass on the 26th ult. was recognised as a splendid success by probably one of the most cultivated and critical, as well as one of the largest audiences ever assembled in St. James's Hall. The great difficulties of the chorus part of the work were gone through admirably by the choir; and the effect produced by some of the movements, especially the concluding chorus of the Creed, was overwhelming. The solo singers were Mdme. Lemmens-Sherrington, Mdme. Patey, Mr. Cummings, and Sig. Federici, who all did full justice to the music. The second performance will take place on Monday evening, the 8th.

RATES LEVIED IN LONDON.

The Registrar General, in his last annual summary, says on this subject,—"The rates levied in the metropolis for 1875 are not yet published. But the Statistical Department of the Board of Trade has kindly supplied a return of the rates for the year 1874 of great interest. It shows that the rates levied for education by the Metropolitan School Board were 105,951*l.*; by the Metropolitan Board of Works, 345,817*l.*; by the Local District Boards, 1,338,525*l.*; by the Vestries for the relief of the poor, 1,613,201*l.*; under the Metropolitan Police Act the chief portion of 602,028*l.* was levied; and by the Corporation and Commissioner of Sewers for the City of London 213,507*l.* were raised. The coal and wine dues levied within the metropolis amounted to 314,422*l.*

But the most formidable rates are levied for those two most useful and now indispensable articles, water and light: for these, the Gas Companies levy 2,981,389*l.* for gas and meters; the Water Companies 1,131,034*l.* for water; making in the aggregate 4,112,023*l.* Their paid-up capital is set down at 20,667,555*l.*,* the profits or the excess of revenue over expenditure at 1,627,454*l.*† Assuming that there could be no saving by consolidation or improved plant,—as the Metropolitan Board borrows money at 3½ per cent., and could certainly borrow, on the securities they offer, 20,000,000*l.* at 4 per cent.,—the ratepayers might be supplied by them with gas and water at half the present cost; for 800,000*l.* instead of 1,600,000*l.* a year in round numbers. Thus 9d. in the pound of rateable value will pay expenses and 4 per cent. on capital; the other 9d., making 18d. in the pound, twenty-two enterprising companies have acquired the power to levy for an indefinite time.

* Of this capital, however, 3,965,297*l.* is loan capital borrowed at rates of interest varying from 4 to 5 per cent. and in one case only to 6 per cent. per annum; not therefore entitled to dividends.

† The following is the detailed return of revenue and expenditure:—

Total paid-up Capital, Revenue, and Expenditure of the Metropolitan Gas and Water Companies for the financial Year ended in 1874.

	Total paid-up Capital.	Total Revenue.	Revenue from Gas and Meter, or from Water Rents.	Total Expenditure.
	£	£	£	£
Gas Companies ...	10,616,493	3,703,200	2,981,389	2,767,274
Water Companies	10,051,062	1,147,148	1,131,034	455,620

N.B.—Large sums are cleared by the sale of coke and other products.

THE SYSTEMATIC MEASUREMENT OF THE HUMAN FIGURE.

My excuse for not answering your correspondent "Meter" before is that I have been engaged in making and setting up "an instrument for the identification of persons, and for measuring the proportions of the human frame" in the forthcoming exhibition of scientific instruments at South Kensington. In answer to the very pertinent question of your correspondent, as to how or by what method the Greeks obtained the canon of proportions of the human figure, handed down to us by Vitruvius (*Builder*, March 11, 1876, p. 249), I infer from a statement made in chapter i., book iii., that they measured a great many individuals, and taking the average of these measures, when that average was found to be some aliquot part of the whole, to be the normal proportion the part measured should bear to the whole figure.

In the Library of Venice there is a pen-and-ink drawing by Leonardo da Vinci in illustration of the proportions of the human figure, handed down to us by Vitruvius, with a translation in Italian of the Latin text. It represents a man standing in a square, with his arms extended horizontally, touching with the extremity of his fingers the two vertical lines, while the upper horizontal of the square touches his head, and the lower the soles of his feet. With this figure is combined another in illustration of a statement in the text of Vitruvius; and besides this, in Leonardo's drawing are other horizontal proportional measures given, which do not occur in any copy of Vitruvius I have been able to consult. When the time comes I should be very happy to show "Meter" the measuring instrument in the South Kensington Exhibition.

Joseph Bonomi.

THE "STIFF" MEMORIAL ALMSHOUSES ROUGHAM, NORFOLK.

On the 20th of April, Mr. James Stiff, of Lambeth, laid the memorial stone of six almshouses for aged and deserving widows, which he had determined to found and endow, at a cost of 2,500*l.* The inscription on the stone is as follows:—"These almshouses were founded by James Stiff, esq., in grateful recognition of a long and successful business career. This memorial stone was laid on the fiftieth anniversary of the founder's leaving his native village of Rougham. April 20th, 1876." The erection of the houses, from designs by Mr. John Taylor, of London, has been entrusted to Mr. John Watson, builder, of Bury St. Edmunds. The material used is red brick, with string-courses, &c., of terra-cotta, from Mr. Stiff's potteries, at Lambeth.

THE PAVING QUESTION.

Mr. Davis, agent to Sir Thomas Gabriel, was summoned (at Hammersmith Police-court) by Mr. Jones, clerk of the Fulham District Board of Works, who sought to recover the sum of 59*l.* 11*s.* 1*d.*, being the apportioned expenses in respect of several houses in Elm-grove, Hammersmith, which had been repaired under the compulsory powers of the Act.

Mr. Chapman, who defended, said it was a private road belonging to Sir Thomas Gabriel, who had kept it up at a considerable expense, therefore the Board had no right to step in.

Mr. Jones said there was a thoroughfare in the street to a public footpath through an opening in a wall. The Board pulled down the wall, but they had put it up again.

Mr. Davis was examined, and said he had known the road since 1846. At one time there was a door in the wall, and each tenant was provided with a key. The door was taken away about twenty years ago. Sir Thomas was applied to some years ago to dedicate the road to the public, but he refused.

Mr. Ingham decided it was a new street, and made an order for the payment of the money, subject to a case.

Fairford Windows.—Correspondents direct attention to the fact that "restoration" of some of these remarkable windows is being commenced in a way which threatens injury.

THE ASSESSMENT OF ECCLESIASTICAL DILAPIDATIONS.

THE following "case and opinion" have been made public by Archdeacon Denison, the counsel consulted being Mr. J. Parker Deane and Mr. Walter G. F. Phillimore:—Two cases of assessment of "dilapidations" have recently arisen in the diocese of Bath and Wells which have caused a widespread feeling of surprise and alarm among the clergy at large—surprise because the thing chiefly marking the character of those assessments is a new and strange thing in the history of dilapidations; alarm because if allowed to stand it becomes a precedent for establishing the rule of an arbitrary and wholly unlimited liability as against the outgoing incumbent. The cases are those of Axbridge and Paulton. In the case of Axbridge the surveyor ordered a window to be restored and a reredos to be removed which was put up (as far as can be ascertained) about the year 1722, and left untouched by successive incumbents from that time to the present. The following is an extract from the bishop's order:—"Repair and make good the four-light window in east wall with the tracery in head of same, filling the opening with glazed and leaded quarry lights as originally, and removing *ex necessitate* the Corinthian columns and entablature in the interior, with woodwork at sides now partly decayed." The outgoing incumbent objected (though not formally to the bishop) to being called upon to pay for restoring to its original condition a window which had been blocked up by the erection of the reredos some 150 years ago, and which it must be presumed was legally placed there; but the diocesan surveyor supports his report on which the bishop's order is based by the following quotation from the judgment of Mr. Justice Bayley in the case of Wise *v.* Metcalf, about the year 1829:—"Upon the whole we are of opinion the incumbent was bound to maintain the parsonage and also the chancel, and keep them in good and substantial repair, restoring and rebuilding when necessary, according to the original form, without addition or modern improvement. The opinion of counsel has been asked whether it is reasonable to put the construction for which the surveyor and bishop contend upon the words 'restoring and rebuilding when necessary according to the original form' taken with their context. In this case the late incumbent had nothing to do with the illegal destruction of the window which he was called upon to restore, and it is contended that the words 'when necessary' cannot be construed to go beyond necessary substantial repairs, and cannot be made to include restoration of what the outgoing incumbent had had no hand in removing."

In the Paulton case the order of the Bishop had not yet been received, but the surveyor reports as works necessary to be done (*inter alia*) the making of a fence to a glebe field, which from time immemorial has been in common with other property, and never had any such fence when it became glebe, about sixty years since; and also the repairing a gate leading to the same, which has never been repaired by any vicar, but always by the owner of the estate adjoining the glebe field, and with which it has always been in common; also the placing of well-harness to all wells on the glebe land where such have hitherto been put up at the charge, not of the glebe-owner, but of the tenant; also the pointing of walls on the vicarage premises which were never pointed before.

DISPUTE AS TO AN ARBITRATOR'S AWARD.

ROBINSON *v.* ROBINSON.

THIS action came before the Common Pleas Division of the High Court of Judicature on the 26th ult.

Mr. Gully said that this was an action to recover in respect of certain repairs done to a public-house, and the question being one of account it was referred, under the Common Law Procedure Act of 1854, to arbitration. The arbitrator decided in favour of the defendant, with costs, but the present motion was to set aside the award, upon the ground that it had not been arrived at in accordance with a provision in one of the Judicature Acts. This provision said that the referee should sit *de die in diem*, whilst the arbitrator, in spite of the protests of the plaintiff, adjourned over several days.

Mr. Justice Brett.—You say that the award, though right, should be set aside, because the arbitrator had not sat from day to day?

Mr. Gully.—There was a month between the plaintiff's evidence and the award; and he feared that this evidence had lost its weight with the arbitrator. If the objection were not taken in this way, how could it be taken?

Lord Coleridge said that the rule on which the motion was founded was framed to get rid of one of the greatest scandals of the profession, the interminable nature of arbitrations. No doubt upon the mere *ex parte* statement it would appear that there had been misconduct on the part of the arbitrator; but still the plaintiff had chosen to take his chance of what the award would be. The ground he now relied on might possibly have been a good ground for removing the arbitration, but not for setting aside the award. There was, however, a question whether the arbitrator was right in allowing the defendant seven guineas for costs, and unless the defendant should consent to forego these costs, there would be a rule to send the case back to the arbitrator.

THE EVIDENCE OF "EXPERTS."

CORPORATION OF BIRMINGHAM *v.* ALLEN AND OTHERS.

IN this case, which came before the Master of the Rolls on the 25th ult., Mr. Chitty, Q.C., and Mr. Phipson Beale (instructed by the Town Clerk of Birmingham) moved to restrain Messrs. Allen & Holden from continuing their mining operations at West Bromwich, so as to endanger the large gasworks there belonging to the Corporation.

The form of the notice of motion was "to restrain the defendants from working their mines of coal or other minerals lying near the plaintiffs' land in such manner as to cause subsidence or alteration of the surface of the plaintiffs' land." A plan was made an exhibit to one of the affidavits showing a line beyond which the workings should not, in the opinion of the plaintiffs' witnesses, be allowed to go; and it had been arranged that the defendants should undertake until next motion-day not to work beyond the line, the plaintiffs giving the usual undertakings to be answerable in damages.

Mr. Ince, Q.C., for the defendants, said that he had offered to give that undertaking till the hearing, foreseeing from the nature of the evidence that there must be a conflict between the skilled witnesses.

The Master of the Rolls: There always is.

Mr. Ince said the defendants were only mine-owners under adjacent land. It was no use hearing such a case on interlocutory application, where there was the old story of three experts on one side and three on the other.

Mr. Chitty would not object if the defendants would undertake, in the terms of the notice of motion, to the matter standing over until the hearing.

Mr. Ince could not do that, but suggested that the motion should stand over for a week on the terms arranged, the parties to settle upon some line of stoppage in the meantime.

His Lordship thought that course would be best, as it would give the mining surveyors of the two parties the opportunity of agreeing. It might be well worth the defendants' while to abstain from working a little more than they might be ultimately bound to abstain from working.

Mr. Chitty remarked that all the Corporation desired was to protect their gasworks.

Mr. Ince said if there was any likelihood of the matter being arranged it would be useless incurring the expenses of getting the evidence of a number of experts. Objection must not, however, be made next week that the defendants had not filed affidavits.

Mr. Chitty said if no agreement were come to within a week he would apply for another week within which to file affidavits.

His Lordship, in conclusion, said in all these cases the Court was in great difficulty with regard to the evidence of experts. Even when they were examined in court there was no certainty, and if experts were sent to the spot they might take one view or another. There seemed to be two kinds of experts,—one taking a strong view with regard to obstructions to light, and the other having decided opinions upon obstructions to buildings.

Mr. Chitty said there were apparently two schools of them.

His Lordship said it seemed to be so, and that was the reason he did not send them to make examinations in light and air cases. He might, however, do so in mining cases.

LEGAL.

Smith v. *Beeston.*—In this case, heard in the Lord Mayor's Court, last week, the plaintiff sought to recover 20*l.*, balance of commission for the introduction of persons for the occupancy by buildings of certain land. In answer to Mr. Kemp, who appeared for him, he said that he was an agent for the sale of bricks and timber. In consequence of an advertisement in the *Builder*, he called upon the defendant, to whom he afterwards introduced Mr. Swinford and Mr. Lyons, who took several lots of the land the defendant had to let. He was to receive commission on the introductions. The defendant, an architect and surveyor, was called, and stated, through Mr. Frere, his counsel, that what plaintiff had claimed was in excess of the amount agreed upon as commission. The jury found for the defendant.

Contravention of the Liverpool Sanitary Act.—At the Liverpool Police-court, on the 26th ult., Mr. Evan Roberts, builder and contractor, Tennyson-street, appeared in answer to a summons taken out by the Health Committee, charging him with having, on the 6th ult., caused a house to be built in High Park-street contrary to the provisions of the Liverpool Sanitary Act, 1846, by making an attic-room which was of less dimensions than those specified for attic-rooms in the Act. It appeared from the evidence of Mr. Deacon, the borough engineer, and of Mr. Goldstraw, district building surveyor, that the 20th section of the Act in question required that the attic should be at least 14 ft. wide, and 12 ft. high from the floor to the ridge-tree, whereas it was only 12 ft. 11 in. wide, and 8 ft. 3 in. high. The plans for the building of the houses were passed showing no attics; and during the progress of the work the building surveyor, seeing that attics were being added, informed the contractor, who was the defendant, that they were too small, and would not be allowed. The defendant said he could not help it, as he was simply acting under the instructions af Mr. Richard Owens, the architect. Mr. Owens and the defendant were both spoken to on the subject, but they took no notice of what was said to them, and completed the attics. For the defendant it was contended that the attic as built was far healthier than the one required by the Act. The magistrate (Mr. Raffles) said that in spite of that he would be obliged to convict, as the terms of the Act were so clear and distinct that he could not depart from them. Mr. Atkinson, deputy town clerk, in answer to Mr. Raffles, said that the penalty under the Act would not exceed 5*l.* The modified penalty of 40*s.* and costs was imposed.

SURVEYORSHIP ITEMS.

Bilston.—At a meeting of the Bilston Township Commissioners, on the 19th ult., the Streets and Sewers Committee reported that thirty-six applications had been received for the office of surveyor, from which number the committee had selected Messrs. Lloyd, Greenwood, Baker, and Dennis, as being the most promising candidates, and recommended the Board to appoint one of them. The report was passed, and on a vote being taken, Mr. Llewellyn Lloyd, of Reading, was appointed surveyor to the Board, at a salary of 200*l.* a year. At the same meeting, Mr. Baker moved that the minutes of the meeting of the Board held on the 17th February, adopting the recommendation of the Streets and Sewers Committee to pay the late surveyor (Mr. Taylor) 2½ per cent. for making plans, &c., for the formation of three new streets, be rescinded. He called attention to the terms of Mr. Taylor's engagement, which were that he should do the work required of him by the Board for the sum of 120*l.* per annum, and asked whether that work did not include the preparation of plans. He also referred to a letter from the contractor who did the work in the three streets, in which he stated that the surveyor had also demanded 2½ per cent. from him, but that the payment of such a commission to a public surveyor was unjust and unusual. Several members expressed their opinion that the surveyor had acted improperly in seeking for a commission both from the Board and the contractor, and the consideration of the subject was adjourned.

Maidenhead.—The borough surveyor of Maidenhead has signified his intention of resigning his office on the 24th of June. Judging from a report of the proceedings at a late meeting of the town council, the relations subsisting between the parties have been anything but harmonious for some time past.

Breconshire.—Mr. Chick, of Hereford, architect and county surveyor, has been appointed by the Brecon County Rate Assessment Committee to value the whole of the mansions in Breconshire, for the purpose of arriving at a new estimate of the rateable value of property in that county.

COMPETITIONS.

King's Lynn.—The corporation of this borough having decided upon utilising the White Friars' Field for building purposes, notices were issued to architects inviting plans for the laying out of the field, and offered a premium of 10*l.* 10*s.* for the best. Several plans were accordingly sent in to the committee, who accepted that of Messrs. Adams & Son, of King's Lynn and Wisbech. The plan deals with the entire area of the field, and provides for a number of cottages and villa residences.

Walsall New Cottage Hospital.—At a special meeting of the general committee of the Walsall Cottage Hospital, on the 27th ult., in accordance with the recommendations of the building committee three sets of plans for the new cottage hospital buildings were accepted, subject to their being in accordance with the instructions supplied to the architects, particularly as to cost, the three premiums of 50*l.*, 20*l.*, and 10*l.* being awarded in the following order:—First, Messrs. Henman, Harrison, & Perrott, London; 2nd, Mr. F. E. T. Bailey, Walsall; 3rd, Messrs. R. Chamberlain, Walsall, & Rogers, London.

Rugeley Town-hall and Market.—The nine sets of designs sent in for the new Town and Market Hall at Rugeley were on view in the Town-hall during last week. On Tuesday last, the 2nd inst., the Local Board met to further consider the merits of the plans.

Huyton-cum-Roby Drainage Scheme.—In reply to the advertisement of the Huyton parochial committee offering premiums of 100*l*., 50*l*., and 25*l*. respectively for the three best plans for the drainage and disposal of the sewage of the district, sixteen plans were sent in. At a special meeting of the committee on the 18th ult. the first premium was awarded to Messrs. Gotto & Beesley, of Westminster; the second premium to Mr. R. Vawser, of Warrington; and the third premium to Mr. T. Mellard Reade, of Liverpool.

Sevenoaks Drainage.—At a meeting of the Sevenoaks Local Board on the 1st inst., the report of Mr. Rogers Field, C.E., who had been called in to advise the Board as to the merits of the plans submitted for draining the district, was read, and his award was as follows:—1st. 100*l*., "Sanitas, No. 1," Mr. T. Hennell, Delahay-street, Westminster. 2nd. 50*l*., "Vanitas Vanitatum," Messrs. Dudley & Cadet, of Gresham House, Old Broad-street, London. 3rd. 30*l*., "Commodus," Mr. W. D. Campbell, Box Grove-road, Guildford. Mr. Field stated that the two first were nearly on a par, and both of them good.

HAMPSTEAD VESTRY-HALL COMPETITION.

SIR,—While inspecting the drawings for the above, prior to the decision of the Vestry, my attention was called to a gentleman in the room very busy with a two-foot rule, pointing out the merits (?) of the design marked "Cavendo Tutus" to all comers. Upon speaking to him, I discovered he was a vestryman, and he stated to me that he knew whose design it was, and had seen it prior to its being sent in, and he also knew the author of the design to which was finally awarded the second premium. "Cavendo Tutus" appears to have ignored all the conditions,—the large hall showing to hold about 400 people, if I mistake not, instead of 800, as required.

By a strange coincidence, the author of the second design turns out to be the same gentleman whose designs for the Hampstead Cemetery were accepted; Mr. I'Anson, the referee, having placed his design last.

It would almost appear from this that, as your correspondent stated in your last issue, it was a "foregone conclusion."

Hampstead is doing bravely in competitions.

NOT A COMPETITOR.

CHURCH-BUILDING NEWS.

Old Hill.—Trinity Church, Old Hill (a populous district in the parish of Rowley Regis), was consecrated on the 19th ult. It is built to accommodate 1,000 worshippers, and comprises a nave 96 ft. long in a single span of 38 ft.), north and south transepts, and a small chancel, and north and south porches. On the north side of the chancel is a spacious organ-chamber, for which Messrs. Brindley & Foster are building an organ, and at the south-east angle will be the tower, at present in progress of erection, which will have a total height of 110 ft., and will contain a heavy peal of eight bells, by Messrs. Taylor, of Loughborough, and a clock, by Joyce, of Whitchurch. The church is in the Early Decorated style, with a slight French feeling in treatment, the principal features being the large traceried windows in the transepts and chancel, and the lofty chancel-arch supported upon enriched corbels. The roof is open-timbered. The pulpit is of Caen and Penkridge stone, with alabaster shafts, and the font is of similar materials. The whole of the works have been carried out by Mr. R. Thompson, builder, of Kidderminster, under the superintendence of Edward Howells, clerk of works. The pulpit and font are constructed and carved by Mr. W. Forsyth, of Worcester, and the architect is Mr. J. T. Meredith, of Kidderminster. The total cost will approach 11,500*l*.

Inworth (near Kelvedon).—An offer has been made by a land-owner in the parish of Inworth to restore the ancient and interesting parish church, dating, it is said, from the era of the Norman Conquest. The condition, however, upon which the offer is made is, that the small sum of 150*l*. be raised between the rector and his friends towards the restoration of the chancel. The plans for the chancel and nave have been prepared, and the work is ready to be proceeded with, under the direction of the Diocesan Architect, Mr. Joseph Clarke, F.S.A., as soon as a guarantee for the payment of the conditional sum of money is given. The tower, which fell in the middle of the last century, has been replaced by a wooden bell-cote; and the plans embrace its re-erection.

Stoke (near Guildford).—An iron church, for a new district to be called St. Saviour's, and situate in the Woodbridge-road, has been opened. The site was given by the Earl of Onslow. The church contains 300 sittings, and has its entrance at the east end, the chancel being at the west end. The warming is effected by hot-air pipes, and the lighting at night by means of three gas coronas depending from the ceiling, each supplied with eighteen jets. The roof of the church is of stained woodwork, matching with the seats and wall panelling. Mr. C. Mead, of London, was the builder, and Messrs. Jones & Willis supplied the interior fittings, the cost of the whole work being about 700*l*.

Murton.—On the 18th ult. the memorial stone of a new church at Murton, Dalton-le-Dale, to be dedicated to the Holy Trinity, was laid by the Rev. E. H. Shipperdson. The buildings were commenced a short time ago, and the walls have already attained a considerable height. When finished the structure will consist of a nave with a south porch and two transepts. The chancel will not be built at present, but provision will be made for it, a north aisle, and an organ-chamber, while one of the transepts will be used as a temporary vestry. The church will afford accommodation for about 400 persons, and will have an open timbered roof, with the ceiling plastered between the moulded ribs. The building is in the Early English style. The architect is Mr. C. H. Fowler, of Durham; and the contractors for the whole of the buildings, are Messrs. R. Robson & Son, also of that city.

Hollingbourne.—The restoration of the parish church of Hollingbourne, Kent, has now made considerable progress. The pillars and arches have been scraped and cleaned; a new floor has been laid down, with air-pipes for thorough ventilation placed beneath, and the oak beams of the roof have been scraped, and cleaned with oil. The whole of the nave is now re-seated in British oak, the work having been executed by Messrs. Franklin & Son, of Deddington, Oxon, from the plans of Mr. G. Gilbert Scott. Mr. Scott designed a different pattern for each aisle, in order to hide the width of the nave, which is 11 ft. more than its length. The north aisle leading up to the Culpepper chantry has oak finials at the end of each seat. The raised portion at the east end of this aisle, which was formerly a chapelry with a side altar, is the only portion of the design not completed, Mr. George Duppa (a parishioner) objecting to his square pew (for which there is a faculty) being removed. The architect had proposed replacing the old oak screen, which has been destroyed, and seating the inclosed portion with oak stalls, which would have added greatly to the design. The vicar still hopes to see the stone mullions of the windows in the nave restored, and the windows re-glazed and leaded. The architect's design also included the organ, with illuminated pipes, being corbelled on the west wall of the nave, where there is no arch leading into the tower, and which consequently presents a rather bare appearance, now that the unsightly gallery where the organ formerly stood has been taken down.

Murston.—A further step towards the completion of Murston Church, Kent, has been taken in the erection of chancel seats, the gift of the rector, which were first used on Easter Sunday. The seats are by Messrs. Rattee & Kett, the wood and stone carvers, of Cambridge, and are of solid English oak. The seats consist of six stalls on the south side, with carved divisions, and two benches on each side of the chancel for the men and boys of the choir, terminated by solid bench-ends with elaborately carved poppy-heads. Accommodation is thus gained for sixteen choirmen and twenty boys, forty-two seats in all.

Holford.—St. Mary's Church, Holford, has been reopened, after restoration under the direction of Mr. Norton, architect. There is an open roof, which is entirely new. The floor is paved with encaustic tiles, and the seats are of carved oak. Above the altar-table is a reredos of alabaster, there being in the centre an inlaid cross of Devonshire marble, in the right panel the passion-flower. The altar-cloth is of crimson cloth and velvet, the passion-flowers and white lilies being worked on the velvet by Mrs. Prentice. Messrs. Davis & Son, of Taunton, carried out the instructions of the architect.

Ridge.—The tower of the old parish church of Ridge, near Hertford, is now being restored under the superintendence of Mr. Chapple, clerk to the St. Alban's Abbey Restoration. The church belongs to the fourteenth century. The cost of the work is mated at 1,800*l*.

Kelvedon.—It has been resolved to restore the parish church of Kelvedon, at a cost of about 2,000*l*., from plans by Mr. A. W. Blomfield, architect.

Blewbury.—The first portion of the restoration of Blewbury Church, Oxon, comprising the nave and west tower, has been completed. On removing the old roof of the nave, the timbers were found to be in such a rotten condition that, with the exception of one wall-plate, none could be used again. The present roof is, therefore, entirely new, and is of oak, modelled exactly after the original plan, panelled, and covered with Broseley tiles, surmounted by a crest. The floor is laid with Godwin's tiles, wooden blocks being placed under the seats. The western end of the south aisle is arranged as a baptistery, in which the ancient font is replaced, surrounded with encaustic tiles of a rich pattern. The pulpit stands upon a stone base, and is framed in oak with walnut panels, on which are carved the emblems of the four Evangelists. The whole church has also been thoroughly drained. It is warmed with two of Musgrave's slow combustion stoves. It is for the present seated with chairs. The Ecclesiastical Commissioners, as lay rectors, have promised to restore the chancel.

Thirsk.—The work of restoring the parish church has now fairly begun. A start has been made to take the lead from the roof, and the whitewash of generations is being scraped from off the interior of the building. Traces of painted figures which once decorated the walls have been met with in the nave.

Walton (Liverpool).—The foundation-stone of the new church of St. John the Evangelist, Walton, was laid on the 17th ult. by Lord Skelmersdale. The new church has been planned with a view to its being carried out in separate portions as the funds permit. In the first instance it is proposed to open a building consisting of three bays of the naves and aisles, the chancel, organ-chamber, and temporary vestry, and accommodating about 600 worshippers. The promoters then hope to be in a position to proceed with the permanent clergy and choristers' vestries, and to complete the nave and aisles to the west end. The building will then contain its full complement of sittings, namely, 950, of which 500 will be free and unappropriated. Lastly, the tower and spire will be completed when the Building Committee are financially strong enough for the undertaking. In designing the building the architects, Messrs. Aldridge & Deacon, have used a free adaptation of Thirteenth-century Gothic, and have endeavoured to depend for effect more upon proportion and outline than on elaboration of detail. The length of the complete nave is 94 ft. 6 in. by 33 ft. 6 in. in width. The chancel is 31 ft. in length by 25 ft. in width, and each side is 16 ft. wide.

Bridgnorth.—The church of St. Mary Magdalene, Bridgnorth, was re-opened on Easter Tuesday, after considerable alterations and improvements, including an extension of the former inadequate chancel. These additions were commenced in the spring of 1875, when Mr. W. O. Foster contributed 1,000*l*.; Mr. W. H. Foster, M.P., 500*l*.; and Messrs. J. Pritchard, A. F. Sparkes, and T. M. Southwell, 100*l*. each. Numerous donations have also been received to beautify the edifice, of which Telford was the original architect. The presents to the church include the chancel stained-glass windows, three in number, executed by Messrs. Wailes, of Newcastle-on-Tyne, under the superintendence of Messrs. Weaver & Whiting, commemorating incidents in the life of St. Mary Magdalene. The lectern, a brass eagle, value fifty guineas, has been purchased. The new chancel is fitted with choir-seats of oak, and to it has been removed the organ, which was formerly in the gallery. The church was erected in 1792. The new alterations have been carried out by Messrs. Wall & Hook, of Brimscombe, under the superintendence of Mr. A. W. Blomfield, architect.

Aintree (near Liverpool).—The foundation-stone of the new church of St. Peter's, Aintree, was laid on the 17th ult. by the Bishop of Chester. The present church was originally used as a cock-pit, and was converted into a place of worship about the year 1846, being licensed by the Bishop. It has accommodation for about 230 people. The new church is to accommodate about 550 people, 180 free sittings being provided. The designs are by Mr. A. P. Bell, Manchester, who has selected the style of the thirteenth century. The church will consist of nave and chancel, with north and south aisles,

the chancel terminating in a five-sided apse. The whole of the external treatment, with the internal arches, strings, mouldings, &c., will be executed in red sandstone. The church will be roofed with red Staffordshire tiles, with ornamental ridge of special design.

DISSENTING CHURCH-BUILDING NEWS.

Eckington. — The Wesleyan Methodists of Eckington have just erected a memorial chapel, given by Mrs. George Wells and family, in memory of the late Mr. George Wells. The style of the new edifice is Grecian. The building stands 20 ft. back from the road, and at the summit of a large flight of broad stone steps stretching the whole width of the building. The façade is worked entirely in dressed stone of a light tint, and consists of columns and pilasters, with carved caps, surmounted by a moulded entablature, which is again surmounted by a balustrade and vases, the whole rising to a height of 40 ft. The main entrance under the portico is by a wide and lofty archway, with deeply-moulded archivolt, the entrances to the galleries being at either end of the portico, and surmounted by foliated trusses bearing a cornice. In the interior, the pews, which will accommodate 700 persons, are arranged in the amphitheatre style, with gallery round the entire building, and a recess at the back of the pulpit for the organ and choir. The architect is Mr. John H. Kent, of Chesterfield, and the contractor Mr. James Fidler, of Eckington. The cost of the chapel and ground will be about 5,000*l.*

Old Shildon.—On the 17th ult. the foundation stone of a new Wesleyan Chapel was laid at Old Shildon by Mr. J. W. Pease, M.P. The chapel will seat nearly 900 persons, and is estimated to cost 4,000*l.*

Sudbury.—A new Mission Chapel was opened at Sudbury on the 17th ult. The building is of red brick, with white facings and string-courses; the interior is fitted up with a raised daïs and benches, and it will accommodate 150 people. The architect was Mr. Pertwee, of Chelmsford; and Messrs. Jennings & Brown, of Sudbury, were the contractors. The cost was 400*l.*

Northwich.—A new chapel and schools for the Primitive Methodists is in course of erection on a site adjoining Witton-street, from a design by the Rev. William Wray, of Manchester. The style is Classic. The block of buildings, including chapel, school, and class-rooms, covers an area of 108 ft. by 58 ft. and will be built of brick. The roof will be covered with slate, with ornamental crest at the ridge. The school will be 54 ft. 6 in. long, 29 ft. wide, and 16 ft. high inside. The front of the chapel will be in Witton-street. The front gable and wings will be faced with red stocks set in Flemish bond and tuck pointed; it will be 48 ft. 6 in. wide, and 47 ft. high from ground level to apex stone. It will be relieved with dressed stone plinth, bases, shafts, and carved capitals to the entrance-doors, moulded strings, dentil frieze to gable and wings, label mould with carved terminations, quatrefoil piercing for ventilation, and massive moulded coping and apex stone. The inside dimensions of chapel, including orchestra, are 62 ft. long 37 ft. 6 in. wide and 29 ft. high from floor to ceiling, and sittings are provided for 530 persons. The cost will be 2,700*l.*, exclusive of site. Mr. James Holt, of Dunham Massey, is the contractor, and he has sub-let the brickwork to Mr. W. Lambert, of Altrincham, and the stonework to Messrs. G. & R. Rathbone, of Northwich.

Southport.—The foundation stone of a new Congregational Church was laid at Southport on the 10th ult., the site selected being in Upper Portland-street. The new edifice will cost about 4,500*l.*, and will accommodate upwards of 600 worshippers. The style of architecture adopted is Early English.

Piddletrenthide. — A new Baptist Chapel at Piddletrenthide was opened on Easter Monday. The chapel is built of flints and stone, stuccoed on the outside. It will seat about 210 persons; and has at one end a school-room 24 ft. by 12 ft., with folding doors, so that it can be thrown into the chapel if required, and when the partition is removed will seat 80 additional. The chapel is 42 ft. long and 26 ft. broad. The roof is ceiled and divided into panels by stained timbers. The builder was Mr. Charles Young, of Puddletown, and the cost has been 550*l.*

Barnton.—A new Wesleyan Chapel at Barnton, Cheshire, was opened on Good Friday. The style is English Gothic of the Geometrical period. The materials used are red bricks, with other colours sparingly introduced in bands, and Manley stone dressings. At the entrance-end of the chapel is a gallery for the organ and choir, and immediately in front, elevated a few feet from the ground-floor, is a rostrum of mottled pitch pine. At the opposite end is a school-room with heating apparatus by Messrs. Rogerson & Co., underneath. Over the school is a children's gallery, with an arch opening to the chapel. Accommodation is provided for 350 persons. The cost, including land, is about 1,400*l.* Mr. H. J. Bennett, of Northwich, acted as honorary architect, Mr. W. Leicester, of Northwich, being the builder.

Margate.—The memorial stones of a new Wesleyan Chapel at Cliftonville, Margate, were laid on the 25th ult. Messrs. Bushell & Sons are the builders, the amount of whose contract is 4,087*l.* The chapel is to accommodate 800 persons.

Woore.—The foundation-stone of a new Wesleyan chapel at Woore, near Newcastle, Staffordshire, was laid out on the 10th ult. The cost of the chapel, which is Gothic in style, will be 780*l.* Mr. Ellams, of Silverdale, is the builder.

Evenwood.—The foundation-stone of a new Wesleyan chapel at Evenwood, Durham, was laid on the 18th ult. by Mr. J. W. Pease, M.P. The new building will be of stone, in the Gothic style, and will accommodate 230 people. There will also be a schoolroom adjoining, which will accommodate 100 children. The total cost is estimated at 900*l.*

LONDON SCHOOL BOARD.

THREE more schools were lately publicly opened by the Board in various parts of the metropolis. One is situated at Sydenham-hill, at the back of the Lecture-hall, affording accommodation for 582 children; the amount of the contract being 5,703*l.* It is in two blocks, one of two stories for the boys and girls, the other of one story for the infants. The playgrounds are large, and the situation very open and healthy. The contractor was Mr. R. Lonergan, of Plumstead; the clerk of works being Mr. Ashford. Another school is situated in Bonner-street, Bethnal-green, at the corner of Green-street. It is a three-storied building, with a covered playground on the ground-floor for girls and infants; the latter having school and class-rooms in a separate block. The schools will hold 814 children; and the contract price was 9,098*l.* The builder was Mr. Sergeant, of Hackney; clerk of works, Mr. W. D. Gough. The playgrounds here also are ample. A third school is placed at the angle of Nightingale-street and Capland-street, Marylebone, near Portman-market. Owing to the peculiarities of the site, it is planned in the form of a hollow square, having on the ground-floor a covered playground for infants, and on the flat roofs (which are laid with patent asphalte, and protected by brick piers and stout iron railing) similar accommodation for the older children; the playground for the girls being covered with a stout iron and zinc roof. The sanitary conveniences are also at the top, free access being obtained by a double staircase at each end of the building. The number of children is 829; the contract price, 9,942*l.* Messrs. Kirk & Randall, of Woolwich, were the contractors; and Mr. Nicols was clerk of works. All of these schools are plain substantial buildings in the style of Queen Anne; the two first being enriched on the principal fronts with some carved panels in brick, executed by Mr. McCulloch. The buildings are all from the designs of Mr. E. R. Robson, the architect to the Board.

SCHOOL BOARD SCHOOLS.

Buckie, N.B.—New Board schools have been built and opened at Buckie, on the road leading from the Square to Nether Buckie. The style is Early English. The principal feature of the front or north elevation is a square tower in the centre, which divides the building into two wings, and rises to a height of about 60 ft. Accommodation is provided for 600 children. Mr. James Perry is the architect; the contractors for the work being,—Mason, Mr. Alex. Clark, Portgordon; carpenter, Mr. Wm. M'Beth, Buckie; slater, Mr. George Macdonald, Portsoy; plumber, Mr. Wm. M'Rae, Cullen; plasterer, Mr. Robert Hume, Buckie; ironmonger, Mr. Alex. Hendry, Buckie; and painter, Mr. John Geddes, Buckie. The total cost has been 3,391*l.* 12s. 4d.

Camelon, N.B.—The Camelon Public School, the third which the Falkirk Parish School Board has provided, was opened recently. Mr. M'Fadzen, of Edinburgh, is the architect.

Kilsyth.—The Kilsyth "Burgh Academy," which has just been erected by the Kilsyth Burgh School Board from plans prepared by Messrs. James Thomson & Son, architects, Airdrie, was publicly opened on the 5th ult. The building is intended to provide for the accommodation of 600 children, and consists of seven rooms. The largest of these, which occupies the centre of the building, is intended for an infants' schoolroom; its dimensions are 51 ft. by 30 ft. There are two other principal rooms, 61 ft. by 20 ft.; and two class-rooms 24 ft. by 20 ft. There are also two private rooms for the head male and female teachers respectively, and above these are situated stationery store-rooms. The building is in the Italian style. The contractors for the work were,—mason work, John Glen, Kilsyth; joiner work, ex-Bailie Shanks, Airdrie; slater and plaster work, David Logan, Kilsyth; plumber work, John Paterson, Brunswick-lane, Glasgow; painter work, G. A. Clark, Bathgate. The total cost of the school is about 8*l.* per scholar.

Hornsey.—At a meeting of the Hornsey School Board, on the 4th ult., the Works Committee reported that Mr. Chatfeild Clarke, the Board's architect, had laid before them his plans for the proposed new school at Crouch-end. The school is designed for 240 infants, 180 boys, and 180 girls. The plans met with the general approval of the committee, and they were adopted by the Board, subject to the approval of the Education Department.

Bridgend.—A new public school for Bridgend, Alness, has been opened by the Ross-skeen School Board. The style is Romanesque. The mixed class-room, 50 ft. by 20 ft., occupies the centre of the building, while at each end are the class-room and infants' department, which run parallel to each other, the teacher's house being attached to the western block. The whole interior fittings and furnishings are of pitch-pine, varnished. The class-room measures 33 ft. by 18 ft.; and the infant department 36 ft. by 18 ft. The architects were the Messrs. Maitland, Tain; and the contractors were,—builder, Mr. Urquhart, Ferrintosh; carpenter, Mr. A. Mackay, Barbaraville; painter, Mr. Urquhart, Invergordon; plasterer, Mr. Munro, Tain; plumber, Mr. Meikle, Tain; and slater, Mr. W. Ross, Alness.

Longcroft, N.B. — Longcroft Public School, which has just been erected by the Denny School Board, from plans prepared by Mr. T. B. M'Fadzen, Edinburgh, has been opened. It is fitted to accommodate 250 children, and consists of a principal schoolroom and four class-rooms.

Offham.—The new Board school at Offham was opened on the 3rd ult. Mr. George Ruck, of Maidstone, is the architect, and Mr. Thomas Love, of Larkfield, the builder.

MASTERS AND MEN.

Carlisle.—The Carlisle operative joiners have agreed to accept the offer made by the masters of ½d. per hour advance, the increase to commence from the 1st inst. The men asked for an increase from 6½d. to 7½d. an hour, and their pay will now be 7½d. an hour.

Sheffield.—The whole of the Sheffield painters ceased working on the 29th ult., having struck for an advance of 1d. per hour. Subsequently they consented to resume work at an advance of ½d. an hour.

Barnsley.—The masons, bricklayers, labourers, quarrymen, painters, and paper-hangers of Barnsley are all on strike for advanced wages.

Devonport.—Mr. Puleston, M.P., has informed the skilled labourers of Devonport Dockyard that the Admiralty have acceded to their request in an important manner affecting their pensions. Skilled labourers who have been employed at the rate of 3s. 3d. per day for a period of three years are for the future to have their pensions scaled accordingly. Hitherto there has been no distinction between those receiving 3s. 3d. per day and others in receipt of 2s. 9d., all being pensioned on the lower scale.

Warrington.—On the 28th ult., at a meeting of the various building trades of Warrington, the employers granted the following concessions to the men, thus averting the strike which was to have taken place on Monday last, viz.:—Carpenters and joiners, ½d. per hour increase, making the rate of payment 8d. per hour; bricklayers'

wages are increased from 8d. to 9d. per hour, the week's labour to consist of 54½ hours; the bricklayers' labourers' wages are increased to 6d. per hour. The stonemasons and their employers have not yet come to terms, but it is said to be probable that a satisfactory arrangement will be arrived at.

Wigan.—At a meeting of the master bricklayers of Wigan last week, it was decided to offer their men,—who are out on strike for an advance of 3s. per week in their wages, making 36s. in winter and 39s. in summer,—9d. per hour, an advance of 1s. 1½d. per week of forty-nine hours and a half.

Stirling.—It is stated that the master painters of Stirling have agreed to a rise in their operatives' wages from 6½d. to 7d. per hour, and 9½d. per hour for overtime, the rise taking effect on Monday last.

Lanarkshire.—On the 24th ult. a meeting of the master builders in the districts of Motherwell, Hamilton, Wishaw, Holytown, and Bellshill took place at Motherwell to consider the high rate of wages paid to masons in Lanarkshire. It was agreed that a reduction of ½d. per hour be intimated to the men.

Greenock. — The strike of masons still continues, but the majority of the men have obtained work elsewhere. The masters express their determination to stand out, and the men are said to have been greatly "put about" by the Central Executive Committee not approving of the strike. The new asylum and poorhouse at Smithson and other prominent new buildings are being kept back, and the strike, it is anticipated, will lead to some complications with regard to contracts. Of 200 joiners on strike, only forty-seven answered to their names at the "house of call" on the 25th ult. The ship-painters in two of the ship-building yards struck work in order that they might be put on a par with the house-painters in regard to wages. The difference is an eighth of a penny an hour; the house-painters have 8d. an hour, and the ship-painters 7½d. The painters in the ship-building yards have since resolved to return to work on the old terms. Two masons, named M'Donald and Livingstone, on the 26th ult., raised an action against Messrs. Coghill & Sons, contractors for the new asylum, for payment of ½d. per hour of wages extra to what the pursuers had received. After proof, the sheriff gave decree for the sum sued for.

Edinburgh.—At a general meeting of the Edinburgh and Leith Master Builders' Association, held on the 21st ult., it was unanimously resolved to authorise the president and secretary to sign the agreement submitted by the United Operative Masons' Association, to the effect "That the rate of wages be 9d. per hour from 1st May, 1876, till 1st May, 1877." It was further resolved to direct the special attention of the members of both associations to the following clause:—"That neither of the contracting parties shall either directly or indirectly take any action whereby the wages agreed to may be either augmented or reduced, any violation on the part of employer or operative to be immediately reported to the secretaries of the respective associations." At a joint meeting of the Edinburgh and Leith Lodges of the United Operative Masons' Association, held on the 24th ult., a letter from the Master Builders' Association, agreeing to the terms of the operatives, was read. A resolution was moved and unanimously carried, thanking the Master Builders' Association, "and those employers who are not in that body," for so promptly complying with the terms, viz., an agreement for the next twelve months at 9d. per hour.—— A crowded meeting of the Edinburgh joiners was held in St. Mary's Hall on the 21st ult., for the purpose of hearing the result of the voting by ballot in connexion with the demand for a rise of wages from 8d. to 8½d. per hour, the masters, it was reported, having declined to comply therewith. The voting returns showed a considerable majority over the two-thirds required by rule. After the reports had been considered, the following resolution was unanimously passed:—"That this meeting having heard the result of the voting papers, consider the same to be satisfactory, and resolve that all the warnings be given in on Friday, 28th inst., if the advance asked is not conceded." At a subsequent period of the evening an aggregate meeting of the trade was held in the same place, when the following resolution was unanimously adopted:—"That this meeting endorses the resolution already passed at the joint meeting of the four Edinburgh branches, and pledges itself to act along with them in the present movement." After an interchange of opinion, the following was also unanimously agreed to:—"That copies of the foregoing resolutions be forwarded to the employers."

Nottingham.—The painters of Nottingham have struck for 1d. an hour extra wages. They now get 7d. an hour.

Eccles.—About 300 painters in the district of Eccles, Patricroft, Worsley, Swinton, and Pendlebury struck work on the 25th ult. The men originally demanded an advance of 1d. per hour; but owing to the action taken by those on strike in Manchester, they now express their willingness to accept an increase of ½d. This the masters decline to give, but are willing to concede an advance of ¼d., which the men refuse to receive, and hence the strike. The masters are, however, willing to base any future decision on the action of the master painters of Manchester.

Swansea. — The whole of the masons of Swansea who are "society" men held a meeting last week, and passed a resolution expressing their determination to strike on Monday last, unless their demand of 6d. per day increased wages were conceded. The whole of the masters positively state that in the present depressed condition of trade it is utterly impossible to comply with this unreasonable demand. Wages are now 33s. per week for five and a half days' work.

CINERARY URNS.

SIR,—Will you kindly allow me to inquire if any of your archæological readers have any knowledge as to the process of manufacture used in the construction of the cinerary urns frequently found in the walls of our old abbeys, &c., or by what process the notorious "Flint Jack" so successfully imitated the ancient ware? It is obvious they were not made on the potter's wheel, nor is it probable that Jack could have worked a wheel.

FELDSPAR.

Books Received.

Problems in Stone-cutting. By S. EDWARD WARREN, C.E. New York: John Wiley & Son. 1875. London: Trübner & Co.

IN this treatise on Stone-cutting, most of the following subjects are elaborately illustrated by diagrams, to which scales and dimensions are attached, viz., wall and buttresses, piers, arches, wing walls, groins, arched corners, niches, domes, fan vaults, circular and elliptical staircases, &c., arranged in four classes, thus: (1.) Plain-sided structures; (2.) Structures containing developable surfaces; (3.) Structures containing warped surfaces; (4.) Structures containing double-curved surfaces. There are ten folding plates, illustrating the text relating to subjects ranging from the most simple, as a straight-battering wall, to the most elaborate circular work. We recommend the book to the attention of students of engineering and architecture.

VARIORUM.

A WRITER in the new number of *Cassell's Family Magazine* says pertinently: — "The successful engineer must not be the man who decides upon following engineering as a profession simply because it is a respectable occupation, or a lucrative calling, and at the same time possesses no real taste for it. The probability is that such a man will be disappointed, and find it anything but lucrative. Many a man has entered the Bar, actuated by such motives alone, and has become a member of the briefless family; and if a man expects to become an engineer by mere book study, apart from natural choice and natural talent, he will be mistaken. It must be remembered that special occasions call forth special efforts, and bring into prominence special talents; and true as this is, whether viewed politically or socially, in no branch of science, and in no walk of life does this become of more telling force than in engineering. The encroachments of the sea, or the inundations caused by the overflow of rivers, have from remote periods been causes for calling forth engineering talents; the draining of marsh-land, the conveyance of water, the necessity for improving the means of transit and facilitating locomotion—these and many other requirements may be assigned as the causes for the appearance of men of natural talent and force of will to cope with the necessities of the occasion, and we may safely assert that many an engineer of eminence in his day would never have been known had not some great necessity arisen to point his energies, and to give him ground for his operations. Again, some new discovery, the result of accident, or maybe of inductive reasoning, crude and comparatively useless in its germ, has directed general attention to the subject, and quickly has appeared an army of aspirants to honour, armed with a consciousness of their ability to cope with the subject, to develope and improve it. Such a discovery has been the electric telegraph; but certainly neither in ancient nor modern times has any idea presented itself to the human mind which from small beginnings has grown to such gigantic proportions as the railway system; and equally certain is it that no branch of engineering has called forth such a marvellous amount of engineering talent, or of so varied a character; for, whilst the civil engineer has been occupied with the improvement of the permanent way and the means of overcoming the physical obstacles which have presented themselves to his progress, in the crossing of valleys and rivers, and the penetration of mountains, the mechanical engineer has been no less engaged in the improvement of the engine, and the result of this combination of talent is the present railway system of the world."—— A German electrician, M. Siemens, has just shown us that by suspending a little instrument over the sea we can measure the depths below accurately within a fathom. You need no sounding-line, no lead, no plummet, nor apparatus of any description, beyond a tiny instrument, which is hung over the side of a boat, so that its image is reflected upon the surface of the waves, and this proclaims the mighty depths below in the twinkling of an eye. Magic and necromancy are nothing in the presence of this wonderful little indicator, which tells how far it is to the bottom of the sea before the question can well be asked, and it is called the bathometer. How is it done? is the cry, and the question is answered so pithily in the *London and Provincial Illustrated Newspaper* that we cannot do better than quote it:—"All bodies are affected by gravitation, as everybody knows, and a pound weight placed upon the earth is attracted more powerfully than one 100 ft. above the earth; in fact, to speak popularly, a pound weight is heavier close to the ground than it is suspended high up in the sky. Generally speaking, we cannot ascertain the difference or variation in gravitation by means of weights and scales, for the simple reason that these are affected by gravitation also. M. Siemens, however, has contrived a balance that is not affected by gravitation, the balance consisting of two light spiral wires, and thus he can ascertain how an object becomes heavier the closer it gets to the earth. A column of mercury is the body chosen by M. Siemens, and this being hung upon the balance has a greater strain upon the springs, the heavier it grows, or, in other words, the nearer it gets to the earth. Placed on the seashore, this instrument marks 0 on the scale, for the weight is then bearing its hardest on the springs. Take it in a boat, however, where the water is a mile deep, or, in other words, where the earth is a mile away, and the gravitation at once growing less, there is less strain upon the springs, and the indicator moves to a corresponding degree. Having the earth below you is all the same to the instrument, whether this is up in a balloon or in a boat floating upon the sea; for water does not affect gravitation much more than air does. The instrument works, therefore, on a very simple principle, although its practical elaboration required much skill and forethought. As a fact, it may be mentioned that soundings taken with this instrument, which is termed a 'bathometer,' agree very closely with those taken by the ordinary sounding-line."—— The *Journal of Amusement* says:—"We want a roof—a Sunday shelter, and nothing would be easier than to erect one in all open places of Sunday resort. Perhaps if we assisted non-churchgoers to come out of their courts and alleys, and learn a lesson from Nature, we might find they sought those places of worship which, unfortunately, are not as full on a Sunday as they ought to be. Our brain-workers, too, would derive a still larger benefit. Our mortality would be less, and our morality would be greater. Questions of this sort are what we want discussed in Parliament. Members are not in the habit of giving up their Sundays in order to see how the day is passed in Soho, Shoreditch, Leather-lane, Bethnal-green, Bermondsey, and similar districts, or something would have been done ere this to make the Sunday a day of health and happiness to the poor, as, thank God! it now is to the rich."

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

SIR,—Your advertisement columns this week contain an announcement of a general conference of architects to be held under the auspices of the Royal Institute of British Architects during the week commencing the 12th of June next. The programme is in course of preparation, and will include a list of meetings at which short papers will be read and discussions take place on "Improved Dwellings and Artisans Dwellings Act," "General Building Regulations for the United Kingdom," the "Registration and Classification of Houses," and on "Greek Art." Visits will be paid to Westminster Abbey and to some buildings illustrative of the subjects of the papers, and the Institute dinner will close the proceedings on the 16th of June.

The committee hope that as many architects as are able will attend and take part in the conference, and as it is impossible to invite every architect individually, we shall be obliged if you will allow us through the medium of your journal to say that we shall be happy to forward programmes and cards of admission to architects on application to

ALFRED STRONG, F.R.I.B.A.,
J. DOUGLASS MATHEWS, F.R.I.B.A.,
Hon. Secs., Conference Committee

Miscellanea.

The late Mr. Earl.—A correspondent writes with reference to the death of Mr. Thomas Earl, the sculptor:—"Mr. Earl was born in Hull, in 1810, and died at his residence, No. 1, Vincent-street, Ovington-square, on the 28th of April, of so-termed valvular disease of the heart, but really of a broken heart. He gained the gold medal and book for the best historical group in 1839, and was twelve or fourteen years with Sir Francis Chantrey, as designer and modeller, while it is well known that the equestrian statue of George IV. at Trafalgar-square was Earl's work, in Chantrey's employ and studio. For above thirty years Earl exhibited, whenever he had a chance, most artistic works, notably 'Sin Triumphant,' 'L'Allegro,' 'Hyacinthus,' 'Ophelia,' 'Titania,' 'Miranda,' while his bust of her Majesty, now in his gallery, shows how powerful he was in portrait busts. Yet his works were frequently rejected by the Royal Academy, and he lay down quietly to die, and did die, without a murmur or a pain, on finding that his last work, on which he had been employed three years, 'Alexander the Great,' was rejected by the Royal Academy this year."

The City Architect's Salary.—At a meeting of the Court of Common Council, on the 27th ult., the Officers and Clerks' Committee, reporting on the reference of the 10th of February, 1876, on the letter of Mr. Horace Jones, architect and surveyor, soliciting a reconsideration of his salary, and also upon the terms of his appointment, recommended that his salary should be increased from 1,500*l.* to 2,250*l.* a year, the same to embrace his remuneration for the performance of the duties of his office, and for all works, whether ordinary, special, or exceptional, carried out by him, such increase of salary to date from Midsummer, 1873; and further recommending that the terms of his appointment be altered accordingly. Mr. Roberts suggested that the consideration of the report be postponed, as it would probably lead to a protracted debate; and this suggestion was approved. Mr. Fricker has given notice of the following amendment:—"To agree with the committee in their report, excepting that the salary be 2,000*l.* a-year, to date from Christmas, 1875."

Higher Education for Sheffield.—A writer in the *Sheffield Independent* says that Mr. Alderman Firth's liberal design to furnish the town with a commodious and handsome building for the promotion of the higher education in connexion with our universities, is being matured. The plan embraces class-rooms of various size, which may also be used as lecture-rooms where the numbers attending are likely to be under 200, and of a principal lecture-room, capable of seating 600 hearers, 55 ft. square, 30 ft. high, and well lighted from the two sides. Other rooms provide for various needful adjuncts of the scheme. There will be what may be called a sustentation fund provided by an investment of 5,000*l.*, and a second investment of similar amount to be devoted to scholarships. The property will be vested in trustees, the management being in the hands of an elected council.

Institution of Surveyors.—At the next meeting, to be held on Monday evening, May 8, a discussion will take place upon the paper read by Mr. W. H. Michael, at the last meeting, entitled "The Working of the Sanitary Acts in Rural Districts."

Overhead Telegraph Wires in London.—In the House of Commons, on the 24th ult., Mr. Anderson asked the Postmaster-General if his attention had been called to a letter published lately in which Sir John Hawkshaw stated that suspended telegraph-wires were safe only for about twelve years; if he had heard that several fatal accidents had occurred from fractured wires falling into crowded streets; and if he would arrange gradually to alter all wires in cities and towns to underground ones or have the suspended ones carried, where practicable, in such a way as to cross streets at right angles, or make the distance between the supports at least 7 ft. less than the elevation, or in some other way reduce the risk. Lord J. Manners, in reply, said there were only two fatal accidents in London during the seventeen years since the telegraph wires were placed overhead, and one of these occurred twelve years ago. It was intended to substitute as far as possible underground for overhead wires, and to carry those which would have to be carried overhead at right angles as far as was practicable.

Paving Works at Whitechapel.—The Whitechapel District Board of Works, at its last meeting, proceeded to open and consider tenders for the execution of certain paving works which it had been previously determined to carry out in Commercial-street, Royal Mint-street, and Church-street, Mile-end New Town. These were based upon a schedule of prices prepared by the surveyor, and were announced as follows:—Messrs. E. & H. Beevers, 8 per cent. above; Nowell & Robson, 7 per cent. above; J. Mowlem & Co., 6½ per cent. above; J. S. Gabriel, 5 per cent. under; and J. J. Griffiths, 2½ per cent. above. After some discussion, in the course of which it was stated that the contract would amount to from 15,000*l.* to 20,000*l.*, it was resolved that the tender of Mr. Gabriel be accepted.

The Victoria (Philosophical) Institute.—A meeting of this Institute was held on Monday, at its rooms, 10, Adelphi-terrace. After the election of new members, of whom fifty were announced as having been admitted during the past four months, it was stated that Professor Birks would deliver the Annual Address for 1876, and that the next three meetings, by kind permission, were to be held at the house of the Society of Arts. A paper on "The Metaphysics of Scripture" was then read by Professor Challis, F.R.S., in which he took into account that department of metaphysics which comes after, and is intimately related to, natural science, his object being to inquire, in this limited sense, whether the basis of metaphysics could be said to exist in the teaching of Scripture. Many took part in the discussion.

London and Middlesex Archæological Society.—The general meeting of this society will be held at the Tower of London on this Friday, the 5th of May. The several points of interest will be described as follows:—The White Tower, by the Rev. Thomas Hugo; St. John's Chapel, Mr. Alfred White, F.S.A.; the Beauchamp Tower, Mr. Charles Baily; the Traitors' Gate, the Bloody Tower, and the Undercroft of the Wakefield Tower, Mr. George Lambert, F.S.A.; the Jewels, Professor Tennant; and St. Peter's Church, Mr. G. H. Birch.

Price of Horses.—Last week twenty-five harness-horses, forming the cab-stock of Mr. Dawkins, of Islington, were brought to Mr. Rymill's hammer, at his Repository, Barbican, when the animals, many of which were purchased for coach-work, realised an average of 46*l.* 4*s.* per head. At the same time and place fifty-one English dray and cart horses, the property of Mr. Frederick Wiggins, the contractor, of Goswell-road, were sold at prices reaching an average of 74*l.* 1*s.* each. This does not indicate any fall in the price of useful horses.

Fine Arts Exhibition at Paris.—The Fine Arts Exhibition was opened on the 1st inst. Works are exhibited by about fifteen English painters, including Messrs. Wyld, Orchardson, Bates, Mitchell, &c., and twenty-six American painters, among whom are Messrs. Leland, Lippincott, Parker, Baird, Pearce, Knight, Ramsay, Tait, Ward, Cole Bacon, Healy, and the sculptor Bartlett.

Value of Property at the West End.—The London Crystal Palace Bazaar, Oxford-circus, was sold by auction, by Messrs. Farebrother, Ellis, Clark, & Co., on the 25th ult., and was purchased by Mr. Peter Robinson for the sum of 15,600*l.*

The National Byron Memorial.—At a meeting of the committee, held on Monday, it was resolved to hold the question of material for monument in abeyance until evidence shall be taken as to the probable effect of the climate on marble. Artists will be permitted to furnish sketch-models not exceeding 2 ft. in size, and an application will be made to the proper authorities for a room in the South Kensington Museum, wherein the several designs may be publicly exhibited. Money is still wanted.

Highgate Archway.—The Highgate Archway-road carriage and foot tolls ceased on the 29th ult., and the road has now become a free, untolled public highway. This removal is according to the provisions of the Holyhead Road Act, 1861, by which the Government accepted a composition of 9,000*l.*, payable by instalments, in satisfaction of a debt of 13,000*l.* and interest advanced towards the making of the road to the Highgate Archway Company.

The Rejected Architectural Drawings.—The curator of the Museum of Building Appliances writes to us offering an arrangement for the exhibition, at so much a square foot of wall space, of the architectural drawings rejected at the Royal Academy. As it seems to be simply a commercial project, we must leave him to take his own means to make it known.

Knightsbridge Barracks.—The *Morning Post* states that the plans for the reconstruction of the cavalry barracks at Knightsbridge, by Mr. T. H. Wyatt, are now on view in the Tea-room of the House of Commons. The front to the Knightsbridge-road is to be of red brick with stone dressings. The "back front" facing the park will be a little more ornamental.

Reduction in Screws.—One of the Birmingham manufacturing companies, on the 26th ult., made a reduction in the price of wood screws amounting to 12½ per cent. on the net.

TENDERS

For Tarnden Bridge, near Besenden, Kent. Mr. Martin Bulmer, architect:—

Chesman	£167 10 0
Bridge	154 0 0
Shoebridge	143 0 0
Ames (accepted)	129 10 0

For rebuilding Shalmesford Bridge, near Canterbury, Kent. Mr. Martin Bulmer, architect:—

Matthews	£1,284 15 0
Gaskin	1,097 0 0
Cozens	1,080 0 0
Ames	1,075 0 0
Wilson	1,051 0 0
Bugbird	1,033 13 0
J. & T. Judges (accepted)	947 0 0

For repairs to the houses, &c, Licensed Victuallers' Asylum, Old Kent-road, London. Mr. W. F. Potter, architect:—

Webb	£186 0 0
Eaton	170 0 0
Hersee	126 10 0
Blott	120 0 0
Ormston	109 10 0
Hayworth (accepted)	97 0 0

For six marble tablets to be fixed in the chapel of the same Asylum:—

Houghton	£39 0 0
Bird	35 15 0
Gaffin & Co.	30 10 0
Cook	29 8 0
Cain	27 0 0
Hersee	24 0 0
Blott	24 0 0
Wilkins & Sons (accepted)	19 17 6
Dorey	17 17 0

For repairing and painting works at The Sweeps Lavender-hill, Clapham, for Mr. Thomas Dives. Mr. W. Newton Dunn, architect:—

Pitman & Cuthbertson	£315 0 0
Clements (accepted)	297 0 0

For alterations and additions to No. 89, High Holborn, for Messrs. G. Houghton & Son. Mr. John Butler, architect:—

Hoare & Son (accepted)	£1,280 0 0

For new south wing and laundry at Leyton House, Essex. Mr. J. George Hall, architect:—

	Wing.	Laundry.
Turner	£2,250	£350
Bangs	2,216	352
Stimpson & Co.	2,049	321
Reed	1,997	311

For new buildings and fence at the Canterbury Cemetery, for the Burial Board:—

	Buildings.	Iron Fence.
Cozens	£4,400 0	£987 10
Naylar	4,378 0	996 0
Gaskin	4,350 0	929 0
Wilson	4,311 0	950 0

For alterations and additions in forming picture-galleries at No. 58, Pall Mall, for Mr. William Cox. Mr. Thomas Dudley, architect. Quantities supplied by Messrs. J. & A. S. Ball:—

Bywaters	£938 0 0
Curtis	933 0 0
Newman & Mann	895 0 0
Callum	830 0 0
Stairs	806 0 0

For constructing the Marine Town Esplanade, Sheerness:—

Gaskin	£3,697	8	11½
Hall	3,587	12	6
Geere (accepted)	2,925	0	0

For draining and roadmaking on the estate of Messrs. Bryan & Meadows, on the Rockingham-road:—

J. & G. Henson	£780	0	0
Barlow	740	0	0
Payne & Son	713	0	0
Gibbins (accepted)	580	0	0

For new Wesleyan Chapel, Northampton. Mr. S. J. Newman, architect:—

Croxford & Co.	£3,400	0	0
Poole	2,955	0	0
Hall	2,494	16	0
Watkin (accepted)	2,398	0	0

For alterations, repairs, &c., to the Pembroke Castle, Bemerton-street, Caledonian-road, for Mr. C. Howland. Messrs. Bird & Walters, architects. Quantities supplied:—

Kelly, Bros.	£1,850	0	0
Nightingale	1,756	0	0
Newman & Mann	1,740	0	0
Lawrence	1,730	0	0
Williams & Son	1,717	0	0
Anley	1,630	0	0
Brown	1,630	0	0
Hockley	1,495	0	0

For alterations, additions, and repairs to Greenwich-road Congregational Church. Messrs. Searle, Son, & Hayes, architects. Quantities supplied by Mr. C. H. Searle:—

Newman & Mann	£2,315	0	0
Williams & Son	2,320	0	0
Dove, Bros.	2,245	0	0
Colls & Sons	2,177	0	0
Roberts & Sons	2,056	0	0
Sharpington & Maxwell	1,589	0	0

For the erection of Congregational Church, East End, Finchley, Middlesex. Messrs. J. Tarring & Son, architects. Quantities supplied by the architects:—

Tarrant & Sons	£8,785	0	0
Newman & Mann	8,575	0	0
Dove, Bros.	8,435	0	0
Brass	8,434	0	0
Roberts, Bros.	8,347	0	0
Browne & Robinson	8,346	0	0
Perry & Co.	8,215	0	0

For proposed new building and alterations to present building for out-patients department at the German Hospital, Dalston. Mr. E. A. Gruning, architect. Quantities supplied by Messrs. Williams & Gritten:—

Lidstone	£7,110	0	0
Perkins	6,520	0	0
Brass	6,113	0	0
Shurmur	6,057	0	0
Conder	6,033	0	0
Merritt & Ashby	6,030	0	0
Lawrence	5,969	0	0
Ennor	5,891	0	0
Newman & Mann	5,795	0	0
Carter	5,700	0	0

For warehouse and factory, Tower-street, Londonfields. Mr. J. B. Walton, architect. Quantities by Mr. F. Lee:—

		Credit for Old Materials.
Patman & Fotheringham	£5,998	£200
Taylor	5,720	185
Bangs & Co.	5,680	250
Hobson	5,576	200
Ennor	5,456	3 0
Jarvis	5,280	300
Newman & Mann	5,106	155

For new mission-room, and dwelling-house adjoining, in Cherry Garden-street, Bermondsey, for the Rev. Brookes Deedes. Mr. R. Hesketh, architect. Quantities by Messrs. Franklin & Andrews:—

Lugg	£4,650	0	0
Kent	4,514	0	0
Bulmer	4,464	0	0
Downes	4,433	0	0
Coleman	4,403	0	0
Almond	3,925	0	0
Newman & Mann (accepted)	3,834	0	0

For new premises, King Edward-street, Newgate-street, for the Vicar and Churchwardens of Christchurch Parish. Mr. Thomas Renton, architect. Quantities supplied:—

Fitch & Sons	£1,936	0	0
Oliver	1,928	0	0
Pritchard	1,912	0	0
Nightingale	1,780	0	0
Newman & Mann	1,745	0	0
Morter	1,678	0	0

For new warehouse, Golden-lane, for Mr. J. K. Farlow. Mr. R. P. Notley, architect. Quantities supplied by Messrs. Linsdell & Gifford:—

McLachlan	£3,311	0	0
Adamson & Sons	3,263	0	0
Morter	3,243	0	0
Hart	3,240	0	0
Rudkin	3,190	0	0
Falkner	3,185	0	0
Bangs & Co.	3,139	0	0
Greenwood & Sons	3,130	0	0
Newman & Mann	3,124	0	0
Brass	2,980	0	0
Browne & Robinson	2,885	0	0

For the erection of farm buildings and cottages at Wood Lee, near Fgham, Surrey, for Mr. J. K. Farlow. Mr. R. P. Notley, architect. Quantities supplied by Messrs. Linsdell & Gifford:—

	Farm Buildings.	Cottages.
Falkner	£1,700	£730
Newman & Mann	1,686	733
Greenwood & Sons	1,627	711
Browne & Robinson	1,516	696
Bangs & Co.	1,389	687
Pithers	1,286	761
Adamson & Sons	1,373	663
Odes	1,173	535

For works, 24, Albert Embankment. Mr. C. Young, architect:—

Greenwood & Sons (accepted).

For alterations and additions to the Kent Penitentiary, Stone, Dartford. Mr. A. R. Barker, architect. Quantities by Mr. J. O. Abbott:—

For new Laundry Wing, Alteration to House, &c.

Jackson & Shaw	£3,400	0	0
Downs & Co.	3,308	0	0
Brass	3,226	0	0
Naylar	3,085	0	0
Blake	3,054	0	0
Gumbrell	2,995	0	0
Foster	2,900	0	0

For new Road and Fencing, as per plan.

Downs & Co.	£92	0	0
Jackson & Shaw	90	0	0
Foster	90	0	0
Brass	72	0	0
Blake	68	0	0
Naylar	65	0	0
Gumbrell	65	0	0

For the erection of corn-mill for the Midland Federal Co-operative Corn-mill Company (Limited). Mr. T. Hind, architect. Quantities supplied:—

Major	£3,957	0	0
Gilbert & Piper	3,800	0	0
Kellett	3,698	0	0
Bass & Hodgkin (accepted)	3,624	0	0

For the erection of skating-rink, New Chester-road, Rock Ferry, Cheshire. Messrs. Troughton & Prescott, architects. Quantities supplied:—

Smith	£1,923	16	0
Anwell	1,522	9	0
Williams	1,470	12	0
Davies (accepted)	1,400	0	0

Blackfriars.—Messrs. Newman & Mann's tender has been accepted for reinstating the fire damage to the warehouse and other premises in the Broadway, Blackfriars, burnt down in February last.

Great Northern Railway.—The Directors of this company have accepted the tender of Mr. Joseph Firbank, of Newport, Mon., for the additional tunnels at King's-cross, the new station in York-road, and the lines in connexion therewith. The works are to be pushed on forthwith.

TO CORRESPONDENTS.

We are compelled to postpone a number of communications.

Pictures at the Royal Academy will be reviewed at some length next week.

Dr. P. (sketches shall appear).—J. P. (cancelled, having appeared elsewhere).—C. C. O. (there was a vessel so propelled, though not on the Regent's Canal. We have no precise particulars of it).—F. & H. C. (we are compelled to decline recommending).—P. & C.—J. D. H.—W. P.—C. S.—T. J.—J. D.—E. S.—B.—Sir E. L.—H. B. W.—O. S.—W. G. S.—B. M.—J. J. & Son.—W. H.—C. W.—G. T.—T. A.—S. S. & Sons.—W. T. M.—J. H.—R. M. Y.—Mr. G.—Messrs. H.—T. H.—J. S. K.

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

Bath Stone Office,
Corsham, Wilts.

Dear Sir,

Westwood Ground Stone.

The want of a Ground Stone superior to the Box Ground, has long been recognised, and we are now in a position to meet that want.

Our Quarries at Westwood are producing a Ground Stone of excellent quality, which surpasses the Box Ground in the following particulars.

Evenness of Texture,	*It is free from hard bars and soft clayey beds.*
Soundness,	*It can be relied on not to open venty.*
Shapeliness.	*The rock being naturally sound it is not necessary to cut it into a variety of shapes inorder to remove vents. The blocks are therefore square and shapely, and can be converted with the smallest waste.*
Depth in Bed.	*Blocks five and six feet deep are readily obtained.*

The Quarries have been worked in a primitive manner for upwards of a century, and the local buildings in which the stone has been used furnish ample evidence of its durability and effective appearance.

The cost of obtaining the Westwood Stone is more than that of Box Stone, and it is therefore necessary for us to charge two pence per foot cube extra for it. At this price it is the cheapest as well as the most satisfactory Ground Stone in the market. We have recently opened quarries on Combe Down, which are producing stone of excellent quality. We continue to supply Corsham Down, Corsham Ridge, Box Ground, and Dressed Stone.

Your commands will always oblige, yours truly,

RANDELL, SAUNDERS, & Co., Limited.